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HS-013 467 - HS-013 536
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U.S. Department of
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National Highway
Traffic Safety
Administration



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S.B.T.*

Highway Safety Literature

... A SEMI-MONTHLY ABSTRACT JOURNAL

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A document containing several articles is announced as complete volume under an HS number referring to it as a whole. Entries for individual articles are listed under their own HS numbers.

SAMPLE ENTRIES

JOURNAL ENTRY

Title of Document { **SYNTHESIS OF CASE LAW JURISPRUDENCE RELATING TO WET-WEATHER HIGHWAY CONDITIONS**

Journal Citation → Highway Research Record n 376 p29-36 (1971)

Author(s) → D. C. Oliver 1971
Sponsored by Highway Res. Board Steering Com. for Workshop on Anti-Skid Program Management and presented at the workshop.

Search Terms { Descriptors: *Liability, *Negligence, *Accident responsibility, *Legal responsibility, *Wet road conditions, *Court decisions, *State government, *Skidding accidents, *Warning signs, *Highway maintenance, *Litigation, *Icy road conditions,

Abstract { The extant case law on legal liability for accidents occurring on icy and wet highways has established three central areas and one subarea in the jurisprudence of maintenance liability. These areas are compliance with general duties in order to escape liability; damages resulting from noncompliance (negligence); contributory negligence as a bar to recovery; and advisory signing as a technique in meeting general duties. Court decisions covering these four areas are presented.

NHTSA Accession Number → HS-012 289
*Subject heading in Subject Index

CONTRACT REPORT

EQUIPMENT AND PROCEDURES FOR MEASURING GLARE FOR MOTOR VEHICLES. FINAL REPORT

Corporate author → Teledyne Brown Engineering
N. E. Chatterton J. D. Hayes E. W. George 1972 102p
Contract DOT-HS-089-1-139

Availability → NTIS

Descriptors: *Glare, *Glare reduction, *Visual perception, *Photometers, *Luminance, *Hydraulic equipment, *Central vision, *Field of view, *Backgrounds, *Contrast, *Light conditions, *Brightness, *Test facilities, *Test equipment, *Vehicle safety standards, *Simulators, *Light, *Reflectance, *Measuring instruments,

A procedure and description of equipment for measuring glare from a driver's own vehicle are presented. The procedures are based on a disability glare theory as applied to foveal vision. Two pieces of apparatus were constructed to provide the measurement capability. One of them simulates diffuse sky glare and the other simulates direct solar glare. Methods of combining data from these measurements are presented along with scaling laws selected to provide a value for glare as it would be under natural daylight conditions. A standard for allowable glare levels from the vehicle is developed which is independent of the measurement procedure. Test results from a passenger car are presented and compared with this standard. Recommendations for improvements to the apparatus and additional research requirements for improvement to the theory are made.

HS-800 731

*Subject heading in Subject Index

1B. Injuries

COMPARISON OF THE AGGRESSIVENESS OF DIFFERENT VEHICLES AND THE SAFETY THEY AFFORD

Organisme National de Securite Routiere (France)
For primary bibliographic entry see Fld. 1C.
HS-013 530

STUDY ON THE INJURIES OF THE INFERIOR MEMBERS DUE TO ROAD ACCIDENTS

Organisme National de Securite Routiere (France)
J. Leroy 1972
In HS-820 217, International Conference on Experimental Safety Vehicles (3rd) Report, Washington, D. C., 1972 p2-10-2-13

Foot injuries, Etiology, Injury causes, Injuries by seat occupation, Fractures, Occupant vehicle interface, Posture, Pedals, Wheels, Rear engine vehicles, Front engine vehicles, Injury research

Little more than five per cent of people injured in vehicle accidents suffer from foot injuries, and almost 80% of these people are drivers. Foot injuries are caused by involuntary foot rotations either by wedging between the pedals or in the folds of the car floor or by compression of the foot when the driver's knees are squeezed under the instrument panel or when he brakes extremely hard. Many foot injuries to drivers and passengers result from wheel intrusion into the passenger compartment. In front engine cars the engine helps to prevent passenger compartment intrusion in frontal impacts. In vehicles where the seat is straight and high and the driver sits with his leg at an almost right angle with the thigh, no foot injuries have occurred.
HS-013 531

1C. Investigation And Records

SOME HUMAN FACTORS CONSIDERATIONS IN HIGHWAY SAFETY

National Hwy. Traf. Safety Administration, Washington, D.C.
P. R. Knaff, C. A. Baker 1971 20p
In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.3

Human factors, Accident studies, Accident prevention, Accident statistics, Accident factors, Accidents by vehicle make, Accident rates, Driver age, Injuries by vehicle size, Accident research, Priorities

The resources expended on a particular problem should be a function of the size of the problem multiplied in some manner by a factor which reflects both the likelihood and effectiveness of the solution. Accident statistics, therefore, play an important role in the activities of the National Highway Traffic Safety Administration (NHTSA). The method used by NHTSA to apportion its resources to deal with the traffic accident problem is briefly examined. Although there are inadequacies in some of the accident data, they are still useful in stimulating hypotheses and indicating some of the complexity of the problems faced in highway safety.
HS-013 483

CAR AND TRUCK REAR LIGHTING AND SIGNALING: THE APPLICATION OF RESEARCH FINDINGS

Michigan Univ., Ann Arbor. Hwy. Safety Res. Inst.
For primary bibliographic entry see Fld. 5J.
HS-013 496

PSYCHOLOGICAL AND EDUCATIONAL METHODS OF INFLUENCING DRIVER BEHAVIOR

California Univ., Irvine
For primary bibliographic entry see Fld. 3D.
HS-013 511

COMPARISON OF THE AGGRESSIVENESS OF DIFFERENT VEHICLES AND THE SAFETY THEY AFFORD

Organisme National de Securite Routiere (France)
C. Berlioz 1972
In HS-820 217, International Conference on Experimental Safety Vehicles (3rd) Report, Washington, D. C., 1972 p2-4-2--2-10

Accidents by vehicle size, Fatality rates, Injury rates, Rural accidents, Vehicle pedestrian collisions, Truck accidents, Vehicle fixed object collisions, Vehicle vehicle collisions, Injuries by accident type, France, Motorcycle accidents, Single vehicle accidents

Driver and pedestrian injury and fatality rates by vehicle type on French rural highways in 1969 indicated that the cars most vulnerable in vehicle vehicle collisions are the least vulnerable in vehicle fixed object collisions occurring on rural roads, and vice versa. The greatest number of casualties occurred in accidents involving light, front engine, and low speed vehicles.
HS-013 530

2. HIGHWAY SAFETY

TRAFFIC SAFETY PLANNING AND ADMINISTRATIVE STUDY FOR THE CITY OF SEAL BEACH

Lampman and Associates, Santa Ana, Calif.
R. H. Mohle 1972 31p
Prepared in cooperation with California Office of Traf. Safety, National Hwy. Traf. Safety Administration, and Federal Hwy. Administration. Cover title: Planning and Administrative Study, Seal Beach.
NTIS

Highway safety standards, Safety standards compliance, Local government, Financing, Highway safety programs, Traffic Operations Program to Increase Capacity and Safety, Accident location, Traffic records, Traffic control devices, Traffic engineering, Police traffic services, Pedestrian safety, Driver education, Traffic laws, Highway design, Highway construction, Highway maintenance, Priorities, Planning

The 16 standards of the 1966 Highway Safety Act were reviewed to determine their applicability to Seal Beach and to determine what deficiencies would be correctable through certain safety projects. As part of the study, recommendations, where appropriate, from the Areawide Traffic Operations Program to Increase Capacity and Safety report were considered. It was determined that conditions within the City of Seal Beach justify the City's participation in the program. It is recommended that the initial programming for participation in the pro-

Group 1C—Investigation And Records

gram involve Standards 9, 10, and 13 concerning Identification and Surveillance of Accident Locations Traffic, and Traffic Control Devices. Recommended for second phase programming is a study concerned with Standard 15, Police Traffic Services. The third program is recommended to involve Standard 14, Pedestrian Safety.
HS-845 014

2B. Communications**SOME DRIVING AIDS AND THEIR ASSESSMENTS**

Road Res. Lab., Crowthorne, Berks. (England)
For primary bibliographic entry see Fld. 3D.
HS-013 499

DRIVING AIDS

Transport and Road Res. Lab., Crowthorne, Berks. (England)
For primary bibliographic entry see Fld. 5D.
HS-013 520

2D. Design And Construction

**ACTIVE SAFETY. A CONTRIBUTION TO THE
STUDY OF THE VEHICLE-DRIVER SYSTEM. A
FIRST APPROACH TO THE DEFINITION OF AN
UNDULATION SURFACE FOR ROAD-HOLDING
TESTS**

Alfa Romeo S.P.A., Milan (Italy)
For primary bibliographic entry see Fld. 5R.
HS-013 536

2E. Lighting

**PSYCHOLOGICAL ASPECTS OF DRIVER
BEHAVIOUR. VOL. 2, APPLIED RESEARCH. PAPERS
PRESENTED TO THE INTERNATIONAL
SYMPOSIUM HELD AT NOORDWIJKERHOUT, THE
NETHERLANDS, 2-6 AUGUST 1971
111971 12362P 286REFS**

Contains HS-013 491--HS-013 512.
Corporate author

Driver behavior, Vehicle lighting, Traffic signs, Driver aid systems, Driver education, Driver education evaluation, Night visibility, Rear lamps, Visual perception, Highway lighting, Headlamps, Signal lamps, Car following, Vehicle spacing display devices, Driving task analysis, Tracking, Driving simulation, Driving simulators, Driver improvement, Mass media, Delineators (traffic), Driver skills

Topics covered in the second volume of this symposium include engineering of highway delineation systems, traffic signs, and traffic markers for improved driver perception; improved highway lighting and vehicle headlamps for better night visibility; development of vehicle rear lighting and driver aid systems to aid drivers in car following; an evaluation of driver education programs and suggestions for their improvement; the usefulness of driving simulators for driver training; and methods of influencing driver behavior.
HS-013 490

**THE CODING AND TRANSMISSION OF
INFORMATION BY MEANS OF ROAD LIGHTING**

Stichting Wetenschappelijk Onderzoek Verkeersveiligheid, Voorburg (Netherlands)
D. A. Schreuder 1971 16p
In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.1.B

Highway lighting, Vehicle lighting, Urban highways, Rural roads, Contrast, Low beamed headlamps, High beamed headlamps, Polarized headlamps, Driving tasks, Visual coding

Headlamps should have city beams for dense-traffic urban roads, low beams for light-traffic urban roads and rural roads, polarized highbeams for unlighted rural roads other than freeways, and cut-off lights specially for freeway use. For streets, low-quality overhead lighting will suffice. Cars may use low beams. Heavy-traffic urban roads need high-quality overhead lighting. Cars should not be permitted to use low beams, but should be equipped with city lights or any other type of improved side light. Heavy-traffic rural roads should preferably have good overhead lighting as well. If not, a system of polarized headlights is highly desirable. For driving comfort and convenience, it is advisable for freeways to be lighted throughout. Under all conditions and circumstances where objects, when visible, are not self-explanatory, additional signs must be added.
HS-013 494

2H. Police Traffic Services

**DEVELOPMENT OF AN 'ADVANCED' DRIVER
EDUCATION PROGRAM**

General Motors Proving Ground, Milford, Mich.
For primary bibliographic entry see Fld. 3E.
HS-013 507

**AN OPTIMUM SYSTEM FOR TRAFFIC
ENFORCEMENT/DRIVER CONTROL. VOL. 2
APPENDICES**

111971 12595P REFS Rept. No. CAL-DMV-RSS-72-160-2;
PB-217 953

Contract DL-69-001(002)
Prepared for National Hwy. Traf. Safety Administration and California State Dept. OF Motor Vehicles.
NTIS

Traffic law enforcement, State planning, State motor vehicle departments, California, Accident prevention, Computerized driver records, Regression analysis, Benefit cost analysis, Problem drivers, Traffic courts, Driver licensing, Driver improvement, Flow charts, Penalties, Police, Local government, Traffic law violations, Driver improvement schools, Driver education, Time factors, Point systems, Convictions, Driver intoxication, Accident risk forecasting, New York (State), Traffic ticket systems, State laws, Questionnaires, Surveys

The study approach, driver record analysis, citation survey, Traffic Enforcement/Driver Control System cost analysis, regression modeling and results, questionnaire responses, and cluster analysis experiment used in the development of an improved system of traffic law enforcement and driver control are presented. California's present Traffic Enforcement/Driver Control System is described, and an example of the administrative adjudication of traffic law violations in New York is included.

HS-013 513

AN OPTIMUM SYSTEM FOR TRAFFIC ENFORCEMENT/DRIVER CONTROL. FINAL REPORT, VOL. 1

111971 12150P REFS Rept. No. CAL-DMV-RSS-72-160-1; PB-217 952

Contract DL-69-001(002)

Prepared for National Hwy Traf. Safety Administration and California State Dept. of Motor Vehicles.

NTIS

Traffic law enforcement, Accident prevention, State planning, State motor vehicle departments, California, Police, Trials, Penalties, Driver records, Driver performance, Driver licensing, Accident statistics, Driver education, Problem drivers, Driver intoxication, Highway safety programs, Driver license examination, Driver attitudes, Vehicle inspection, Traffic courts, Accident investigation, Accident reporting laws, Traffic law violations, Driver improvement schools, Point systems, Warning letters, Time factors, Negligence, Driver behavior, Driver license revocation, Driver license renewal, Convictions, Driver license suspension

In response to a 1968 legislative resolution, improved driver licensing procedures: post-licensing control activities; use of driver records; allocation of traffic officers; and a unified approach to penalizing and treating negligent, intoxicated, and other problem drivers, are recommended for improved traffic law enforcement and driver control. It was found that most suspended/revoked drivers continue to drive and are usually not prosecuted for driving while suspended even when cited for moving violations due to failure or inability of courts to verify the subjects' driving status and driving record prior to adjudication. Another problem was court dismissal of prior drunk driving charges and other practices which prevented the DMV from exercising its revocation authority. An agency should be designated to centralize planning and coordination of traffic safety programs and develop and evaluate more effective accident countermeasures.

HS-013 514

OPTIMUM SYSTEM FOR TRAFFIC ENFORCEMENT/DRIVER CONTROL--THE EVALUATION OF THE RECOMMENDATIONS MADE BY THE CONSULTING FIRM

California Dept. of Motor Vehicles, Sacramento

For primary bibliographic entry see Fld. 2J.

HS-013 515

2I. Traffic Control

PSYCHOLOGICAL ASPECTS OF DRIVER BEHAVIOUR. VOL. 2, APPLIED RESEARCH. PAPERS PRESENTED TO THE INTERNATIONAL SYMPOSIUM HELD AT NOORDWIJKERHOUT, THE NETHERLANDS, 2-6 AUGUST 1971

111971 12362P 286REFS

Contains HS-013 491--HS-013 512.

Corporate author

Driver behavior, Vehicle lighting, Traffic signs, Driver aid systems, Driver education, Driver education evaluation, Night visibility, Rear lamps, Visual perception, Highway lighting,

Headlamps, Signal lamps, Car following, Vehicle spacing display devices, Driving task analysis, Tracking, Driving simulation, Driving simulators, Driver improvement, Mass media, Delineators (traffic), Driver skills

Topics covered in the second volume of this symposium include engineering of highway delineation systems, traffic signs, and traffic markers for improved driver perception; improved highway lighting and vehicle headlamps for better night visibility; development of vehicle rear lighting and driver aid systems to aid drivers in car following; an evaluation of driver education programs and suggestions for their improvement; the usefulness of driving simulators for driver training; and methods of influencing driver behavior.

HS-013 490

TRANSLATION OF DRIVER INFORMATION REQUIREMENTS TO ROADWAY DELINEATION SYSTEMS

Pennsylvania State Univ., University Park; Institute for Res., State Coll., Pa.

J. I. Taylor, R. S. Hostetter 1971 16p

In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 1.2.A

Delineators (traffic), Binocular disparity, Raised pavement markings, Reflectorized pavement markings, Stop signs, Road curves, Tachistoscopes, Photographs, Design of Experiments, Red, Driving task analysis, Flow charts, Test volunteers, Laboratory tests

A Delineation Selection Procedure is diagramed, and the preparation of Information-Decision-Action (IDA) models to translate performance requirements to driver information requirements for various geometric situations is described. The IDA model for a horizontal curve is provided. The effectiveness of post delineator and raised pavement marking spacing at a stop approach and stop sign and post delineator color treatment were evaluated in laboratory experiments. Subjects were first given a brief presentation in which two different photographs of an intersection delineation system were simultaneously shown, one to each eye. Each element of the pair was then shown individually. The subject was not told that the brief presentation consisted of two photographs and was asked to identify which of the two longer presentations was the same as the first (brief) presentation. Results are presented for stop sign comparisons, raised pavement marking spacing, post spacing, dual vs. single reference comparisons, treatment comparisons, and color comparisons.

HS-013 491

PERCEPTION OF HIGHWAY TRAFFIC SIGNS

Institutet for Arbetshygien, Helsinki (Finland)

S. Hakkinen 1971 12p 8refs

In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.1.A

Traffic signs, Visual perception, Police vehicle, Laboratory tests, Field tests, Driver age, Driver experience, Driver mileage, Speed, Driver route familiarity, Tinted eyeglasses, Weather, Driver performance, Reviews

Drivers were stopped 400 to 800 meters after passing a new traffic sign and questioned to determine whether or not they had perceived the sign. Sign registration probability was not affected by the speed at which it was passed, annual driver mile-

Group 21—Traffic Control

age, the driver's familiarity with the road, number of passengers, or whether or not the driver wore eyeglasses. Signs were registered more often by drivers wearing sun glasses on cloudy days, drivers driving alone, drivers wearing seat belts, young drivers, drivers who had had a driver's license for a short time, and drivers with a private rather than a professional license. Signs were perceived more frequently on cloudy days and when a police car was parked sufficiently far ahead; an important sign was remembered better than a general warning sign following it; and registration of a supplementary sign depended on the chief sign and the text on the supplementary sign.
HS-013 492

ENGINEERING OF TRAFFIC MARKERS TO SATISFY REQUIREMENTS OF PERCEPTUAL SPACE

Alberta Univ., Edmonton (Canada)

T. M. Nelson, C. J. Ladan 1971 24p 13refs

In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.1.A

Form perception, Traffic signs, Sign shape, Sign design, Driver behavior, Laboratory tests, Driver sex, Time factors, Peak hour traffic, Sign colors, Sign lettering

Many laboratory studies show that a two dimensional object having a flat surface cannot communicate its spatial plane accurately. This fact is applied to driving situations since a traffic marker is to be obeyed only when it faces the driver directly, i.e., its front surface is approximately at right angles to the line of approach of the vehicle. Laboratory studies are reviewed, showing that the conventional flat traffic marker leads to confusions of reference consistent with theoretical expectations. It was found that a curved marker will reduce error greatly, because it efficiently communicates plane of reference via a distortion of shape.
HS-013 493

RESOURCE ALLOCATION STUDY FOR TRAFFIC SAFETY [IN THE CITY OF SAN JOSE].

IMPLEMENTATION PLAN AND PROCEDURES. TECHNICAL NOTE

Stanford Res. Inst., Menlo Park, Calif.

J. O. Williams 1971 95p 6refs Rept. No. ORD-TN-8925-2
NTIS

Highway safety programs, San Jose (Calif.), Traffic delay, Signalized intersections, Computerized records management, Uncontrolled intersections, Computer programs, Fortran, Punched cards, Traffic signal delay time, Traffic records, Automated accident records, Highway accident potential, Flow charts, Accident prevention, Benefit cost analysis, Highway improvements

A task organization plan is presented which shows the interrelationship and the estimated time required for seven major tasks involved in the implementation of recommendations for a highway safety program in San Jose, Calif. The tasks include identification of problem areas, selection of traffic capital improvement projects, study requests, development of a procedures manual for street maintenance, establishment of a data base, evaluation of safety improvements, and development of a street deficiency reporting process. The tasks are to be performed by the San Jose Public Works Department.
HS-845 013

2J. Traffic Courts

AN OPTIMUM SYSTEM FOR TRAFFIC ENFORCEMENT/DRIVER CONTROL. VOL. 2 APPENDICES

111971 12595P REFS Rept. No. CAL-DMV-RSS-72-160-2;
PB-217 953

Contract DL-69-001(002)

Prepared for National Hwy. Traf. Safety Administration and California State Dept. OF Motor Vehicles.

NTIS

Traffic law enforcement, State planning, State motor vehicle departments, California, Accident prevention, Computerized driver records, Regression analysis, Benefit cost analysis, Problem drivers, Traffic courts, Driver licensing, Driver improvement, Flow charts, Penalties, Police, Local government, Traffic law violations, Driver improvement schools, Driver education, Time factors, Point systems, Convictions, Driver intoxication, Accident risk forecasting, New York (State), Traffic ticket systems, State laws, Questionnaires, Surveys

The study approach, driver record analysis, citation survey, Traffic Enforcement/Driver Control System cost analysis, regression modeling and results, questionnaire responses, and cluster analysis experiment used in the development of an improved system of traffic law enforcement and driver control are presented. California's present Traffic Enforcement/Driver Control System is described, and an example of the administrative adjudication of traffic law violations in New York is included.

HS-013 513

AN OPTIMUM SYSTEM FOR TRAFFIC ENFORCEMENT/DRIVER CONTROL. FINAL REPORT, VOL. 1

111971 12150P REFS Rept. No. CAL-DMV-RSS-72-160-1;
PB-217 952

Contract DL-69-001(002)

Prepared for National Hwy Traf. Safety Administration and California State Dept. of Motor Vehicles.

NTIS

Traffic law enforcement, Accident prevention, State planning, State motor vehicle departments, California, Police, Trials, Penalties, Driver records, Driver performance, Driver licensing, Accident statistics, Driver education, Problem drivers, Driver intoxication, Highway safety programs, Driver license examination, Driver attitudes, Vehicle inspection, Traffic courts, Accident investigation, Accident reporting laws, Traffic law violations, Driver improvement schools, Point systems, Warning letters, Time factors, Negligence, Driver behavior, Driver license revocation, Driver license renewal, Convictions, Driver license suspension

In response to a 1968 legislative resolution, improved driver licensing procedures: post-licensing control activities; use of driver records; allocation of traffic officers; and a unified approach to penalizing and treating negligent, intoxicated, and other problem drivers, are recommended for improved traffic law enforcement and driver control. It was found that most suspended/revoked drivers continue to drive and are usually not prosecuted for driving while suspended even when cited for moving violations due to failure or inability of courts to verify

the subjects' driving status and driving record prior to adjudication. Another problem was court dismissal of prior drunk driving charges and other practices which prevented the DMV from exercising its revocation authority. An agency should be designated to centralize planning and coordination of traffic safety programs and develop and evaluate more effective accident countermeasures.

HS-013 514

OPTIMUM SYSTEM FOR TRAFFIC ENFORCEMENT/DRIVER CONTROL--THE EVALUATION OF THE RECOMMENDATIONS MADE BY THE CONSULTING FIRM

California Dept. of Motor Vehicles, Sacramento
R. S. Coppin, E. K. Ball, R. Herbold, R. C. Peck 1972 30p Rept.
No. CAL-DMV-RSS-72-160-4; PB-219 807
Contract DL-69-001(002)
NTIS

Traffic law enforcement, State planning, California, State motor vehicle departments, Matrix reduction, Accident prevention, Traffic courts, Driver education, Police, Traffic law violations, Driver improvement, Penalties, Driver records, Problem drivers

This supplement includes: background information regarding this study of ways in which to improve California's Traffic Enforcement/Driver Control System and an outline of the management structure established to provide guidance and direction to the study group; identifies areas of concern to management with the product submitted by the consultant firm and explains actions taken to resolve the issues; and presents, in matrix format, a listing of 82 major study recommendations, the position of appropriate state departments, and implementation status for each recommendation.

HS-013 515

SUMMARY OF WORK PERFORMED PURSUANT TO THE DEVELOPMENT OF TRAINING MANUALS FOR A HIGHWAY SAFETY WORKSHOP FOR TRAFFIC COURT JUDGES. FINAL REPORT

111973 1231P
Contract DOT-HS-240-2-414
NTIS

Instruction materials, Program evaluation, Traffic courts, Missouri, Highway safety, Instructor training, Traffic court judges

Pilot testing and evaluation of previously developed workshop materials revealed several important inadequacies in both the content of the material and the manner in which it was presented. As a result, efforts were made to redesign and refocus the workshop. Resources and procedures used in this developmental effort are identified and the testing of the redesigned materials--a trainer's manual and a participant's manual--in a series of training activities in Missouri is described. An evaluation of the revised training materials and recommendations for their future use are included.

HS-800 896

2K. Traffic Records

TRAFFIC RECORDS COURSE. FINAL REPORT

111973 1233P 137REFS
Contract DOT-HS-134-2-498
Report for Jun 1972-Jun 1973.

NTIS

Traffic records, Education, Curricula, New Jersey

The development of a traffic records course is discussed. Course objectives and a course overview are included. A field trial of the course was held June 18-22, 1973. Nineteen students from various New Jersey departments concerned with traffic records in one way or another attended all or most of the course. In general, the course was well received. Recommendations concerning instructors, students, and guest lecturers are made.

HS-800 895

A RESOURCE ALLOCATION STUDY FOR TRAFFIC SAFETY IN THE CITY OF SAN JOSE. FINAL REPORT

Stanford Res. Inst., Menlo Park, Calif.
J. O. Williams, M. A. Robertson 1971 97p 7refs
NTIS

Highway safety programs, San Jose (Calif.), Traffic engineering, Street maintenance, Police traffic services, Traffic signal maintenance, Accident prevention, Local government, Traffic law enforcement, Traffic control, Highway construction, Traffic records, Traffic control devices, Pedestrian safety, Highway safety standards, Traffic congestion, Traffic delay minimization, Highway accident potential, Data banks, Computerized records management, Automated accident records, Safety standards compliance, Highway design

Traffic safety problems in San Jose were identified by reviewing safety standards compliance and traffic safety programs of the Police Department and the Public Works Department Traffic Engineering, Street Maintenance, and Electrical Maintenance Divisions. Recommendations are presented for the Traffic Engineering Division to improve procedures used for identification of problem area locations, selection of traffic capital improvement projects, study requests, evaluation of safety improvements, and street deficiency reporting. Recommendations for the Street Maintenance Division include development of a street maintenance procedures manual, receipt of budget information from Traffic Engineering, and establishment of a data base. Recommendations for the Electrical Maintenance Division also concern the establishment of a data base. The recommendations to the Police Department concern formulation of traffic safety goals, selective enforcement techniques, training, and debris hazard control and cleanup.

HS-845 012

RESOURCE ALLOCATION STUDY FOR TRAFFIC SAFETY [IN THE CITY OF SAN JOSE].

IMPLEMENTATION PLAN AND PROCEDURES. TECHNICAL NOTE

Stanford Res. Inst., Menlo Park, Calif.
For primary bibliographic entry see Fld. 2I.
HS-845 013

3. HUMAN FACTORS

SOME HUMAN FACTORS CONSIDERATIONS IN HIGHWAY SAFETY

National Hwy. Traf. Safety Administration, Washington, D.C.
For primary bibliographic entry see Fld. 1C.
HS-013 483

Group 3A—Alcohol

3A. Alcohol

INFLUENCES OF ALCOHOL ON DRIVING BEHAVIOR IN AN INSTRUMENTED CAR

Vermont Univ., Burlington

M. S. Huntley, Jr., M. W. Perrine 1971 32p 23refs

In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.3

Alcohol effects, Driver behavior, Driver performance, Driver psychological tests, Driver personality, Drinking drivers, Highway Systems Research Car, Blood alcohol levels, Heart rate, Driving tasks, Driver monitoring, Driver errors, Steering reversals, Braking, Speed changes, Visual perception

Two experiments are described in which subjects drove an instrumented car through a gymkhana course with and without having consumed an alcoholic beverage. In the initial study in which driving accuracy was not emphasized, drinking drivers upset significantly more pylons. Furthermore, driving accuracy improved in the alcohol condition with a subtask requirement; and the number of pylons upset was directly correlated with extroversion scores obtained on the Eysenck Personality Inventory. In the subsequent study in which the importance of driving accuracy was emphasized, no significant alcohol or extroversion related reductions in driving accuracy were found. In both studies, alcohol was associated with increases in foot control use rates and with increases in speed change rate, indicating a decrease in driving smoothness. A third study is also described in which the influence of alcohol upon heart rate, control use behavior, and detection of low luminance peripheral light flashes is being investigated in a realistic rural night driving situation.

HS-013 482

SOME MULTIVARIATE ASPECTS OF DRUNKEN DRIVING

Rijksverdedigingsorganisatie TNO, Soesterberg (Netherlands)

J. A. Michon 1971 12p 3refs

In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.3

Alcohol effects, Driver performance, Driver skills, Driver intoxication, Driving task analysis, Driver motivation, Alcohol effect on vision, Driver monitoring, Factor analysis, Blood alcohol levels, Tunnel vision, Day vs night performance, Placebos, Eye movements, Head movement, Steering reversals, Lateral acceleration, Driver reaction time

A study of the effects of alcohol consumption on driving skill is reviewed. The experiments involved driving on a closed stretch of road. Several variables including distance traveled, position in lane, steering, reaction time, eye movements, and head movements were recorded and analyzed with respect to four hypotheses about drunken driving: with increasing blood alcohol levels, performance measures tend to go through a maximum; ignorance about the actual amount of alcohol consumption will lead to larger differences with sober driving performance than will occur when the subject knows the amount; the effects of alcohol on driving performance will differ for night and daylight driving conditions; and shielding off parts of the visual field by external means will lead to different effects under sober than under drunken driving conditions. The first three hypotheses were substantiated by the experiments, how-

ever, there were no interactions between the type of deterioration of the visual field and the blood alcohol level.

HS-013 485

3C. Cyclists

PEDESTRIAN SAFETY FOR URBAN STREETS, VOL.**3. FINAL REPORT**

111972 1269P 23REFS

Sponsored by California Office of Traf. Safety and National Hwy. Traf. Safety Administration.

NTIS

Pedestrian safety, Bicycle safety, Curricula, Instruction materials, Pedestrian education, Child safety education, San Jose (Calif.)

A preliminary pedestrian and bicycle safety curriculum and resource guide, designed to help the elementary school teacher teach pedestrian and bicycle safety, is presented.

HS-845 011

3D. Driver Behavior

VISUAL SCAN PATTERNS OF NOVICE AND EXPERIENCED DRIVERS

Ohio State Univ., Columbus

For primary bibliographic entry see Fld. 3L.

HC-013 505

USE OF PHYSIOLOGICAL MEASURES IN THE ASSESSMENT OF DRIVING LOAD

Birmingham Univ. (England)

A. B. Clayton 1971 16p 13refs

In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.1

Driving task analysis, Stress (physiology), Driver performance under stress, Galvanic skin response measurement, Heart rate, Police, Loading (operator performance)

Driving may be considered as a skilled psychomotor task in which both the skill of the driver and the demands of the traffic system will vary. In certain situations, these demands imposed upon the individual by the traffic environment may temporarily exceed his capabilities. The use of two physiological parameters, galvanic skin response and heart rate, to provide a quantitative measure of the stress produced by the traffic environment is described. A pilot study to assess the effect of stress upon police patrol-car crews on motorways is described. The value of the above techniques is discussed in the context of road and vehicle design.

HS-013 467

THE USE OF MOVIE FILM AND LABORATORY METHODS FOR ASSESSING DRIVING SKILL

American Institutes for Res., Silver Spring, Md.

C. P. Hahn 1971 16p

In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.1

Driver behavior research, Driver monitoring, Driver performance, Driver skills, Driver evaluation devices, Driver errors, Accident risk forecasting, Motion pictures, Correlation analysis, Traffic law violations

A sample was drawn at random from drivers, unaware they were being observed, on the city streets going about their normal business rather than in any kind of a special test or observational situation. The problems of reliability of observation and recording are discussed. Correlational analyses with various indices of accident and violation records yielded typically low coefficients. Predictive grouping from one accident period to another was equaled through the use of statistically weighted potential scores based on error scores from the filmed records. A priori weighted scores from the same records proved to be even slightly better. It appears that samples of normal driving patterns such as those captured in the studies are somewhat predictive of future accident potential but there is a large degree of error.

HS-013 468

QUANTIFYING AND SPECIFYING DRIVER BEHAVIOR

Pennsylvania State Univ., University Park

R. A. Olsen 1971 20p 14refs

In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.1

Driver behavior, Driver behavior research, Driver experience, Driver errors, Driver skills, Driving task analysis, Decision making, Driver modeling, Driving task models, Perception, Driver reaction time, Problem solving

Generally, a driver is involved in accidents because what he expected to happen was not in full accord with what did happen. He may have acted from lack of information, from confusion, from overestimating his own skill, from inaccurately predicting vehicle-road reactions or, most often, from misinterpreting the intentions of others. Where discrepancies exist between the driver's conception, his problem space, and physical relationship, the task environment, or between the concepts of two interacting drivers, there is an error or clash of expectancies. Experience tends to reduce the frequency of these conflicts as the driver is better able to match the probabilities of alternative conditions. Training tends, in theory at least, to structure more efficient driver problem spaces, reducing the error between actual dangers and the driver's perception of them. If the system were perfect, training and experience or other forms of feedback would continually mold driver behavior toward some ideal which permits a driver to predict accurately the outcome of each choice and his relation to other drivers.

HS-013 469

AN EXPANDED CYBERNETIC MODEL FOR ANALYZING DRIVER BEHAVIOR

Technion-Israel Inst. of Tech., Haifa

A. Peranio 1971 15p 7refs

In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.1

Driver behavior research, Cybernetics, Driver reaction time, Driver vehicle road interfaces, Man machine systems, Psychological factors, Human factors, Environmental factors, Decision making, Driver performance, Vehicle characteristics, Highway characteristics

Man's ability to gather and process information, make a decision, and actuate the controls of a vehicle in a highway transportation environment is discussed. Under conditions demanding sustained performance, man's limit of one cycle per second in the control loop opens to question his ability as a highway

user. Under best average conditions his reaction time is on the order of 0.5 seconds. The degrading effect of a variety of pathological states on man's performance is also analyzed. Limitations added by the other factors in the system, vehicle, highway, and environment, are considered. Several criteria for safe control and transportation are included.

HS-013 470

OBJECTIVE MEASUREMENTS OF DRIVER-VEHICLE EFFORT UNDER FIELD CONDITIONS AND SOME RELATIONSHIPS

System Devel. Corp., Santa Monica Calif.

J. F. Torres 1971 18p 6refs

In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.1

Driver vehicle interface, Man machine systems, Driving task analysis, Driver behavior, Decision making, Human factors, Driver performance under stress, Physiology, Driver reaction time, Galvanic skin response, Driver monitoring, Acceleration noise, Traffic volume, Traffic density, Regression analysis

Results of a field experiment using a specially instrumented vehicle to measure galvanic skin response (GSR) are described. Strong relationships were found between both drivers' and passengers' GSR's and traffic events independently recorded by an observer riding with the subjects. The regression lines were essentially linear and almost coincident for both driver and passenger. Nevertheless, there appeared to be significant differences between individual subjects since intradriver variation tended to be low. A strong relationship was also indicated between the GSR's and traffic volume. The use of physiological measures, however, requires elaborate instrumentation and procedures. Relationships between acceleration noise and traffic density are shown to have greater dispersion than those between travel time and traffic density. The largest source for this error is attributed to interdriver differences.

HS-013 471

MEASUREMENT AND INTERPRETATION OF DRIVER-VEHICLE SYSTEM DYNAMIC RESPONSE

Systems Technology, Inc., Hawthorne, Calif.

D. H. Weir, D. T. McRuer 1971 23p 9refs

In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.1

Driver vehicle interface, Driving task models, Driving task analysis, Vehicle control, Steering, Driver performance, Perception, Equations of motion, Man machine systems, Mathematical models, Feedback control, Vehicle dynamics

The vehicle is represented by differential equations of motion. The driver is characterized with quasi-linear describing functions and remnants to give a frequency domain description suitable for multiloop control tasks with random-appearing inputs. The model and data shown consider steering or directional control situations, but the techniques and principles are also suitable for headway control. Simulation experiments with random crosswind gust disturbances were used to measure driver-vehicle functions for a number of driver subjects and experimental replications. Interpretation of the data in terms of the driver-vehicle model indicates that the driver's outputs can be explained in simplest terms as functions of lateral position and heading. With this interpretation all of the subjects had part of their output directly proportional to heading while three of the

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five subjects also exhibited high-frequency lead equalization on heading (or the parallel addition of heading rate).

HS-013 472

INVESTIGATIONS ON COMPARATIVE OXYGEN PULSE VALUES MEASURED IN CAR DRIVING AND IN EQUIVALENT WORK ON BICYCLE ERGOMETER

Fiat Auto-Avio Res. Labs., Turin (Italy)

V. Wyss 1971 16p 17refs

In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.1

Oxygen consumption, Heart rate, Driver monitoring, Driver performance, Stress (physiology), Biomedical monitoring, Electrocardiography, Laboratory tests

Measurements were made on three subjects while driving a medium size car in motorway, town, up-hill, and down-hill courses and while performing such work on a bicycle ergometer in the laboratory to produce an oxygen consumption identical with that measured in the driving tests. Oxygen consumption was measured with the open circuit technique and heart rate with continuous e.c.g. recording. For equal oxygen consumptions the oxygen pulse was lower in driving tests than in the equivalent tests on the bicycle ergometer due to the higher heart rate during driving. The higher heart rate is interpreted as the consequence of higher brain structure pulses resulting from emotional factors.

HS-013 473

DRIVER EXPECTANCY: STRUCTURING MOTORIST INFORMATION SYSTEMS FOR SAFETY

Texas A and M Univ., College Station. Texas Transp. Inst.

N. C. Ellis 1971 19p 14refs

In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.2

Driver attitudes, Driver behavior, Driver behavior research, Driver attitude measurement, Decision making, Driving task analysis, Perception, Driver vehicle road interfaces

A general concept of behavior, as it relates to driving situations, is examined to determine its potential for structuring motorist information systems for safe usage. The primary objectives are to: provide an understanding of the importance of the general concept of expectancy; develop an operational definition of driver expectancy; propose a technique for considering driver expectancy in conceptualizing motorist information systems; and develop a taxonomy of factors which influence driver expectancy. To meet objectives, practical utility for the highway engineer is stressed.

HS-013 474

DRIVER CHARACTERISTICS AND TRAFFIC SYSTEM DESIGN

Federal Hwy. Administration, Washington, D.C.

D. A. Gordon 1971 18p 24refs

In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.2

Driver motivation, Driver behavior, Driver attitudes, Trip purpose, Speed patterns, Driver confusion, Highway characteristics, Highway design, Driver experience, Driver reaction time, Psychological factors

Many principles of road design can be understood in terms of the reacting human driver. Three psychological characteristics, particularly important to traffic system design, are discussed. These are driver motivation which is concerned with his general trip purposes, the driver's expectancies relating to the road and behavior of other drivers, and anticipation, the driver's advance planning to overcome man-machine lags.

HS-013 475

VISUAL SEARCH BY AUTOMOBILE DRIVERS

Wisconsin Univ., Madison

For primary bibliographic entry see Fld. 3L.

HS-013 476

CONTROL OF ATTENTION AS A FUNCTION OF RISK AND RISK PREFERENCE

Wisconsin Univ., Madison

G. H. Robinson, S. D. Desai 1971 16p 16refs

Grant PHS-UI00066

In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.2

Driving task analysis, Driver performance, Attention, Driving simulators, Car following, Risk taking, Computerized simulation, Accident risks, Time factors, Probability theory, Low risk drivers, High risk drivers, Vehicle spacing, Economic factors, Distance headways, Hazard perception

An operator's control over his input sources—his attention—can be an important performance limitation in man-machine systems. A laboratory simulation of a car following task was used to generate data on 10 subjects' variations in attention to the lead vehicle as a function of inter-vehicle spacing. The subject's risk preference level and the ratio of the costs of collision to observation are independent variables. Normative models of equal probability of collision and minimum cost are provided for comparison.

HS-013 477

ON STEERING DYNAMICS OF TRACKED VEHICLES—RESULTS OF AN ANTHROPOTECHNICAL INVESTIGATION BY USING A NOVEL DRIVING SIMULATOR

Forschungsinstitut für Anthropotechnik, Meckenheim (West Germany)

For primary bibliographic entry see Fld. 5R.

HS-013 478

EXPERIMENTAL SYSTEMS ANALYSIS OF DELAYED STEERING FEEDBACK

Wisconsin Univ., Madison

For primary bibliographic entry see Fld. 5R.

HS-013 479

DRIVER BEHAVIOUR DURING BRAKING

Ferodo Ltd., Stockport, Cheshire (England)

R. T. Spurr 1971 16p 3refs

In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.2

Driver performance, Braking, Driving task analysis, Driver behavior, Perception, Deceleration, Cues

Experiments in which attempts were made to determine the amount and quality of information the driver requires to stop at

a nominated point are reported. Measurements show that, once he has started to brake, a driver requires very little further information in order to stop at a nominated point. The work so far has been exploratory and so measurements have been limited to a few highly skilled drivers. The amount of information the driver acquires at a glance is of importance, and the more reference points he can use the more consistently he brakes. If the driver's field of view contains a potential hazard, or if he is distracted by an additional task his braking is less consistent. The various results suggest that the driver works to an internal program, taking in data concerning his speed and position and processing this according to the program.
HS-013 480

DRIVING RESEARCH PROGRAM AT STEVENS INSTITUTE

Stevens Inst. of Tech., Hoboken, N.J.
P. E. Fergenson 1971 15p 13refs
In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.3

Driver behavior research, Research facilities, Test equipment, Driving simulators, Instrumented vehicles, Driver records, Driver reaction time, Loading (operator performance), Driver personality, Psychological factors, Driver psychological tests, Variance analysis, Anxiety, Hazard perception, Driving task analysis, High risk drivers, Low risk drivers

The major driver behavior research facilities available at Stevens Institute, including a driving simulator, a fully instrumented test vehicle, and the experimental psychology laboratories, are briefly described. Four recent studies conducted at the Institute concerning information processing, psychological variables, anxiety and information processing, and hazard perception are reviewed. A description of short-term future plans is included.
HS-013 481

INFLUENCES OF ALCOHOL ON DRIVING BEHAVIOR IN AN INSTRUMENTED CAR

Vermont Univ., Burlington
For primary bibliographic entry see Fld. 3A.
HS-013 482

MAXIMUM DRIVING PERFORMANCE--CAN IT BE PREDICTED?

Oklahoma Univ., Norman; Ohio State Univ., Columbus
R. F. Krenek, T. H. Rockwell 1971 20p 9refs
In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.3

Driver performance, Biomedical monitoring, Nervous system, Heart rate, Neurologic manifestations, Driving tasks, Data reduction, Car following, Driver tests, Linear regression analysis

Spontaneous activity in the autonomic nervous system was measured in the laboratory while the subjects were resting. Each subject was assigned a number called the Autonomic Stability Rank which represented the combined spontaneous activity in heart rate and skin resistance. Seven subjects (male, 19-29 years of age, good visual acuity, good health, and adequate recent driving experience) were selected solely on the basis of their Autonomic Stability Rank to participate in driving experiments consisting of open road velocity production and main-

tenance and steady state and transient car following tasks. Linear regressions of lateral and longitudinal precision and accuracy measures on Autonomic Stability Rank were used to investigate the relationship between Autonomic Stability Rank and performance in each portion of the experiment. In general it was found that performance tended to be better for subjects with high Autonomic Stability Rank statistics (persons with little or no spontaneous autonomic activity) than for those subjects with low scores.
HS-013 484

SOME MULTIVARIATE ASPECTS OF DRUNKEN DRIVING

Rijksverdedigingsorganisatie TNO, Soesterberg (Netherlands)
For primary bibliographic entry see Fld. 3A.
HS-013 485

DRIVER BEHAVIOUR AND RESULTS OF SOME PSYCHOLOGICAL TESTS

Road Research Lab., Crowthorne, Berks. (England)
S. W. Quenault, R. D. Fairhead 1971 24p 7refs
In HS-013 461, Psychological Aspects of Driver Behavior, Voorburg, 1971, v1, sect. 1.3

Driver classification, Driver psychological tests, Driver performance, Driver personality, Intelligence, Performance tests, Driver behavior, Manual dexterity, Manual performance, Driver tests, Variance analysis, Driver characteristics

In a pilot study 20 drivers drove around a test route and were classified into one of four subgroups--safe, injudicious, dissociated active, and dissociated passive. Later these drivers took projective personality tests, a questionnaire personality test, an intelligence test, a two hand coordination test, and a reaction test. Results obtained from the intelligence test, coordination test, and reaction test showed no significant differences between any two of the subgroups of drivers. Only one significant difference was found among the classes of drivers on results of the psychological tests--on the extroversion factor of the questionnaire personality test. When the classification of drivers on the basis of projective personality test results was compared with that obtained from the systematic observation of driver behavior, there was no statistically significant agreement.
HS-013 486

ON DRIVING ABILITY AND RELATED FACTORS

Windsor Univ., Ont. (Canada)
A. Raouf, S. C. Sharma 1971 16p 23refs
In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.3

Driver performance, Reviews, Driver behavior research, Alcohol effects, Driver fatigue, Environmental factors, Driving simulators, Blood alcohol levels, Carbon monoxide

Literature dealing with the effects of fatigue, intoxicants, and climatic conditions on driver performance is very briefly surveyed. Some problems connected with live studies and simulator studies are discussed and a brief description of the driving simulator built at the University of Windsor is given. The simulator will be used to study the effect of controlled temperature and the nonpresence of road noises on driving performance during extended test periods.
HS-013 487

Group 3D—Driver Behavior

DRIVER BEHAVIOUR--STUDY OF A SAMPLING OF ITALIAN DRIVERS

Italy Ministero dei Lavori Pubblici, Rome

G. Sorrenti 1971 12p

In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.3

Driver behavior, Italy, Driver characteristics, Surveys, Driver attitudes, Accident statistics, Police, Adolescent drivers, Aged drivers, Female drivers, Motorcycle operators, Male drivers, Truck drivers, Sociological factors, Automobile cultural role

A survey, aimed at analyzing the attitudes, motivations, and psychological dynamics, both individual and social, which lie at the roots of driver behavior was conducted in Italy. Individual clinical interviews and group interviews were employed. Preliminary results of the survey are presented. The positive and negative characteristics of the average Italian driver are discussed and drivers' attitudes towards other road users are outlined.

HS-013 488

AFFECTIVE STATES INFLUENCING DRIVERS' DECISIONS AND MOTOR SKILLS

Cornell Aeronautical Lab., Inc., Buffalo, N.Y.

A. Zavala 1971 15p 7refs

Contract FH-11-7572

In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.3

Accident investigation, Psychological factors, Precrash phase, Accident factors, Sociological factors, Driver personality, Driver fatalities, Driver behavior, Questionnaires, Case reports, Accident studies, Driver intoxication, Suicide by vehicle, Driver mental fitness

The method of obtaining needed precrash information in fatal accidents used by the Cornell Aeronautical Laboratory is known as the psychological autopsy. The origin of the method and procedures used in the psychological autopsy are described. In conducting psychological autopsies the laboratory employs a social-behavioral approach rather than a clinical of psychoanalytic approach. In-depth interviews with a semistructured interview format are held with immediate family members, acquaintances, and associates of the fatally injured driver. These interviews cover: personal relationships; the number and kind of problems he discussed with others; the driver's plans and aspirations; his social and economic environment; recent emotional episodes the individual experienced; and the personality characteristics attributed to the driver by those who knew him. Examples are presented in detail to illustrate the utility of the psychological autopsy.

HS-013 489

PSYCHOLOGICAL ASPECTS OF DRIVER BEHAVIOUR. VOL. 2, APPLIED RESEARCH. PAPERS PRESENTED TO THE INTERNATIONAL SYMPOSIUM HELD AT NOORDWIJKERHOUT, THE NETHERLANDS, 2-6 AUGUST 1971

111971 12362P 286REFS

Contains HS-013 491--HS-013 512.

Corporate author

Driver behavior, Vehicle lighting, Traffic signs, Driver aid systems, Driver education, Driver education evaluation, Night visibility, Rear lamps, Visual perception, Highway lighting,

Headlamps, Signal lamps, Car following, Vehicle spacing display devices, Driving task analysis, Tracking, Driving simulation, Driving simulators, Driver improvement, Mass media, Delineators (traffic), Driver skills

Topics covered in the second volume of this symposium include engineering of highway delineation systems, traffic signs, and traffic markers for improved driver perception; improved highway lighting and vehicle headlamps for better night visibility; development of vehicle rear lighting and driver aid systems to aid drivers in car following; an evaluation of driver education programs and suggestions for their improvement; the usefulness of driving simulators for driver training; and methods of influencing driver behavior.

HS-013 490

ENGINEERING OF TRAFFIC MARKERS TO SATISFY REQUIREMENTS OF PERCEPTUAL SPACE

Alberta Univ., Edmonton (Canada)

For primary bibliographic entry see Fld. 2I.

HS-013 493

FEEDBACK CONCEPTS IN THE DESIGN OF VEHICLE LIGHTING SYSTEM

National Chengchi Univ., Taipei (Taiwan)

For primary bibliographic entry see Fld. 5J.

HS-013 498

SOME DRIVING AIDS AND THEIR ASSESSMENTS

Road Res. Lab., Crowthorne, Berks. (England)

A. Irving, K. S. Rutley 1971 20p 10refs

In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.1.B

Driver aid systems, Brake lamps, Vehicle spacing display devices, Audio devices, Automatic routing, Distance perception, Velocity perception, Car following, Following distance, Time headways, Cinematography, Great Britain

Driver aid systems are being developed to prevent rear end collisions which are often caused by failures in driver distance or velocity perception. A multilevel brake light system, in which more panels are illuminated as deceleration increases, and a station keeping indicator, which allows a driver to maintain a predetermined time gap between himself and another vehicle, are being evaluated to determine their effectiveness in accident prevention. An audio driver communication system is also being developed which can be used for routing and to provide information about the section of road ahead of the driver. The ultimate overall effectiveness of driver aid systems can only be assessed when a high proportion of drivers use them. The Eye-Mark camera which records the scene ahead of the driver together with a spot of light which continuously indicates where the driver is looking is described.

HS-013 499

ON THE EFFECTS OF STATE-VARIABLE FEEDBACK ON DRIVER-VEHICLE BEHAVIOR IN CAR FOLLOWING

Ohio State Univ., Columbus

R. E. Fenton, R. G. Rule 1971 20p 11refs

In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.1.B

Car following, Guidance systems, Vehicle control, Driver performance, Headways, Velocity perception, Distance perception, Driver aid systems, Tracking, Display systems, Performance tests, Design of experiments, Driving task analysis, Mathematical analysis, Automatic headway control

A control stick with a kinesthetic-tactile display was mounted in a 1965 Plymouth sedan, and car following experiments were conducted to determine lead and following car velocity, headway and velocity variance, and driver opinion. Describing-function models obtained from velocity histories were used to compare speed of driver vehicle system response and platoon stability of tested systems. Headway and velocity variances were used to compare tracking behavior while the subjective data measured driver effort and preference. In the most advanced system, compensation was included to reduce vehicle response variation effects, adjust tracking distance to safe headway, and allow the vehicle to automatically respond to sudden changes in lead car speed. This last system resulted in system time constants of less than one second, headway deviations of less than one foot, and little driver effort. It was determined that a platoon of such vehicles would be asymptotically stable.

HS-013 500

THE PRESENT STATUS OF CURRICULA FOR DRIVER INSTRUCTION AND THEIR EVALUATION IN THE UNITED STATES

California Univ. Inst. of Transp. and Traf. Engineering
For primary bibliographic entry see Fld. 3E.

HS-013 502

DRIVER EDUCATION: ITS NATURE AND PROBLEMS

Salford Univ., Lancs. (England)

For primary bibliographic entry see Fld. 3E.

HS-013 503

DRIVER EDUCATION RESEARCH IN THE UNITED STATES--CAN THE NEW DIRECTIONS BE SUPPORTED

National Safety Council, Chicago, Ill.

For primary bibliographic entry see Fld. 3E.

HS-013 504

THE DEVELOPMENT OF INSTRUCTIONAL OBJECTIVES FOR DRIVER EDUCATION THROUGH AN ANALYSIS OF THE DRIVER'S TASKS

Human Resources Res. Organization, Alexandria, Va.

For primary bibliographic entry see Fld. 3E.

HS-013 506

DEVELOPMENT OF AN 'ADVANCED' DRIVER EDUCATION PROGRAM

General Motors Proving Ground, Milford, Mich.

For primary bibliographic entry see Fld. 3E.

HS-013 507

THE UTILITY OF RELEVANT DRIVER SIMULATION FOR TRAINING

Cornell Aeronautical Lab., Inc., Buffalo, N.Y.

For primary bibliographic entry see Fld. 3E.

HS-013 508

AN EXPERIMENTAL EVALUATION OF A SHADOWGRAPH SIMULATOR FOR DRIVER TRAINING

Road Res. Lab., Crowthorne, Berks. (England)

For primary bibliographic entry see Fld. 3E.

HS-013 509

EXPRESSIVE CONSTRAINTS ON DRIVER RE-EDUCATION

Kentucky Univ., Lexington; Pittsburgh Univ., Pa.

For primary bibliographic entry see Fld. 3E.

HS-013 510

PSYCHOLOGICAL AND EDUCATIONAL METHODS OF INFLUENCING DRIVER BEHAVIOR

California Univ., Irvine

F. L. McGuire 1971 16p 22refs

In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.2.C

Driver behavior, High school driving courses, Driver records, Accident rates, Traffic law violations, Accident prevention, Warning letters, Driver education, Driver interviews, Safety campaigns, Safety program effectiveness, Driver improvement

In general, formal programs such as high school driver education, group therapy, and community-wide safety drives have yet to demonstrate effectiveness, while such techniques as warning letters, interviews, and probation do show some promise in preventing accidents and violations. It is concluded that accident-producing behavior is modifiable, but that the best methods and their expected output have yet to be properly researched; there are probably great differences in accident reduction and cost-effectiveness. Because unevaluated programs may waste valuable resources and sometimes even increase accidents, it is essential that all techniques be fully tested prior to implementation.

HS-013 511

MASS MEDIA COMMUNICATIONS AND DRIVER BEHAVIOR

University of Southern California, Los Angeles

G. A. Fleischer 1971 19p 16refs

In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.2.C

Driver behavior, Mass media, Safety campaigns, Program evaluation, Safety program effectiveness, Benefit cost analysis, Highway safety programs, Driver attitudes

Prior research in the area of publicly funded mass media communications reveals little about its effectiveness; none relates cost to effectiveness in an organized manner. Few studies have been directed to attitudinal shifts, and research findings are inconsistent. Some studies have attempted to measure driver behavioral shifts, but research designs have been inadequate, and results are inconclusive. An experiment in developing a procedure for evaluating mass media programs is currently underway at the University of Southern California. Principal features include a real world operating environment (three medium sized California communities), use of radio and television, a campaign directed to the specific measurable type of driver behavior (safety belt usage), and measurement of attitudinal and behavioral shifts. Results of these experiments can be used as standard data by governmental agencies when comparing the

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cost-effectiveness of alternative mass media programs and/or comparing mass media communications to other highway safety campaigns.

HS-013 512

**AN OPTIMUM SYSTEM FOR TRAFFIC
ENFORCEMENT/DRIVER CONTROL. VOL. 2
APPENDICES**

**111971 12595P REFS Rept. No. CAL-DMV-RSS-72-160-2;
PB-217 953**

Contract DL-69-001(002)

Prepared for National Hwy. Traf. Safety Administration and
California State Dept. OF Motor Vehicles.

NTIS

Traffic law enforcement, State planning, State motor vehicle departments, California, Accident prevention, Computerized driver records, Regression analysis, Benefit cost analysis, Problem drivers, Traffic courts, Driver licensing, Driver improvement, Flow charts, Penalties, Police, Local government, Traffic law violations, Driver improvement schools, Driver education, Time factors, Point systems, Convictions, Driver intoxication, Accident risk forecasting, New York (State), Traffic ticket systems, State laws, Questionnaires, Surveys

The study approach, driver record analysis, citation survey, Traffic Enforcement/Driver Control System cost analysis, regression modeling and results, questionnaire responses, and cluster analysis experiment used in the development of an improved system of traffic law enforcement and driver control are presented. California's present Traffic Enforcement/Driver Control System is described, and an example of the administrative adjudication of traffic law violations in New York is included.

HS-013 513

**AN OPTIMUM SYSTEM FOR TRAFFIC
ENFORCEMENT/DRIVER CONTROL. FINAL
REPORT, VOL. 1**

**111971 12150P REFS Rept. No. CAL-DMV-RSS-72-160-1;
PB-217 952**

Contract DL-69-001(002)

Prepared for National Hwy Traf. Safety Administration and
California State Dept. of Motor Vehicles.

NTIS

Traffic law enforcement, Accident prevention, State planning, State motor vehicle departments, California, Police, Trials, Penalties, Driver records, Driver performance, Driver licensing, Accident statistics, Driver education, Problem drivers, Driver intoxication, Highway safety programs, Driver license examination, Driver attitudes, Vehicle inspection, Traffic courts, Accident investigation, Accident reporting laws, Traffic law violations, Driver improvement schools, Point systems, Warning letters, Time factors, Negligence, Driver behavior, Driver license revocation, Driver license renewal, Convictions, Driver license suspension

In response to a 1968 legislative resolution, improved driver licensing procedures: post-licensing control activities; use of driver records; allocation of traffic officers; and a unified approach to penalizing and treating negligent, intoxicated, and other problem drivers, are recommended for improved traffic law enforcement and driver control. It was found that most suspended/revoked drivers continue to drive and are usually

not prosecuted for driving while suspended even when cited for moving violations due to failure or inability of courts to verify the subjects' driving status and driving record prior to adjudication. Another problem was court dismissal of prior drunk driving charges and other practices which prevented the DMV from exercising its revocation authority. An agency should be designated to centralize planning and coordination of traffic safety programs and develop and evaluate more effective accident countermeasures.

HS-013 514

**OPTIMUM SYSTEM FOR TRAFFIC
ENFORCEMENT/DRIVER CONTROL--THE
EVALUATION OF THE RECOMMENDATIONS MADE
BY THE CONSULTING FIRM**

California Dept. of Motor Vehicles, Sacramento

For primary bibliographic entry see Fld. 2J.

HS-013 515

3E. Driver Education

**PSYCHOLOGICAL ASPECTS OF DRIVER
BEHAVIOUR. VOL. 2, APPLIED RESEARCH. PAPERS
PRESENTED TO THE INTERNATIONAL
SYMPOSIUM HELD AT NOORDWIJKERHOUT, THE
NETHERLANDS, 2-6 AUGUST 1971**

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Contains HS-013 491--HS-013 512.

Corporate author

Driver behavior, Vehicle lighting, Traffic signs, Driver aid systems, Driver education, Driver education evaluation, Night visibility, Rear lamps, Visual perception, Highway lighting, Headlamps, Signal lamps, Car following, Vehicle spacing display devices, Driving task analysis, Tracking, Driving simulation, Driving simulators, Driver improvement, Mass media, Delineators (traffic), Driver skills

Topics covered in the second volume of this symposium include engineering of highway delineation systems, traffic signs, and traffic markers for improved driver perception; improved highway lighting and vehicle headlamps for better night visibility; development of vehicle rear lighting and driver aid systems to aid drivers in car following; an evaluation of driver education programs and suggestions for their improvement; the usefulness of driving simulators for driver training; and methods of influencing driver behavior.

HS-013 490

**DRIVER EDUCATION, A REVIEW AND SUGGESTED
INNOVATIONS**

L. G. Goldstein 1971 16p 71refs

In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.2.A

Driver education, Driver education evaluation, High school driving courses, Driver licensing, Driver license examination, Curricula, Instructors, Driver improvement, Driver experience, Age factor in accidents, Accident risk forecasting, High risk drivers

Definitions of driver training and education, the rationale and history of formal driver instruction, effectiveness and criticisms of current programs and special conditions of youthfulness and

inexperience as they relate to highway safety are reviewed. Development of a diagnostic-remedial approach to driver education, to driver licensing, and to driver improvement programs is suggested to ascertain the individual's needs and to help him to achieve an optimal preparation for driving safely and efficiently. Diagnostic test batteries would be needed to delineate individuals' strengths and weaknesses with respect to the driving task. Such tests should be developed on the basis of a probabilistic rationale; each item or task should be causally related to increased or decreased accident probability.

HS-013 501

THE PRESENT STATUS OF CURRICULA FOR DRIVER INSTRUCTION AND THEIR EVALUATION IN THE UNITED STATES

California Univ. Inst. of Transp. and Traf. Engineering
M. H. Jones 1971 15p 12refs

In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.2.A

Driver education evaluation, Curricula, High school driving courses, Behind the wheel instruction, Driver behavior, Instructors, Driver monitoring, Student drivers

At present no adequate specifications for curricula in driver instruction exist. Neither do evaluations of driver training provide reliable information about the outcomes of training programs. The current California Driver Training Evaluation Study and the methods used to gather information regarding educationally relevant variables are described. The variables which are not normally controlled, but which are important, are length of learning session, interval between sessions, teacher-pupil ratio, teacher preparation and experience, teacher-student interaction, and what is actually taught, rather than what the lesson plan states shall be taught. A new reliable system for coding behavior of teachers and students while driving is presented, and an indication of the results to be expected is given. A form for coding lesson maneuvers is included. The usefulness of these descriptions of teacher and student behaviors as an aid in development of proper curricula for driver training is discussed.

HS-013 502

DRIVER EDUCATION: ITS NATURE AND PROBLEMS

Salford Univ., Lancs. (England)

S. Raymond, A. W. Risk 1971 20p 19refs

In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.2.A

Driver education, High school driving courses, Curricula, Driver education evaluation, Driver records, Driver attitudes, Driver characteristics, England

High school driver education curricula and recent research in the field of driver education are examined. Little research has been done on the design and validation of curricula, and the literature reveals an exclusive concern with the difficulties in attempting to evaluate course effectiveness in terms of criteria such as the number of reported accidents or traffic violations. The possible use of performance measures of class and in-car work as criterion measures in place of accident data is considered, but if driver education is to be justified on more than purely educational grounds, the relationships between such performance measures and accidents and traffic violations must be demonstrated. An experimental study in which random assign-

ment of subjects to experimental conditions virtually precludes the possibility of systematic motivational bias occurring as an extraneous variable is in progress at the Salford University Centre for Transport Studies.

HS-013 503

DRIVER EDUCATION RESEARCH IN THE UNITED STATES--CAN THE NEW DIRECTIONS BE SUPPORTED

National Safety Council, Chicago, Ill.

T. W. Planek 1971 20p 25refs

In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.2.A

Driver education, Driver education evaluation, Driver behavior research, Driver records, Driver attitudes, Driver performance, Driver error caused accidents

The United States has decided to lower driver education's priority as a highway safety countermeasure due to lack of evidence that current programs reduce accidents. However, driver education research has been criticized for methodological weakness and use of an invalid criterion (accident frequency). It is suggested that comparative studies be initiated to evaluate current driver education programs with systematic addition of accident avoidance material designed to improve skill through experience and special training; or to upgrade knowledge and aid attitude formation. Random assignment of treatments is necessary to observe effects of treatment as compared with control groups. The criteria for evaluation would include knowledge and attitude measures; on-the-road observation (if possible); self-reported accident, violation, and near miss descriptions checked against official records; and driving experience data. A step-by-step analysis of a countermeasure's effectiveness would be performed as it is introduced into the system.

HS-013 504

THE DEVELOPMENT OF INSTRUCTIONAL OBJECTIVES FOR DRIVER EDUCATION THROUGH AN ANALYSIS OF THE DRIVER'S TASKS

Human Resources Res. Organization, Alexandria, Va.

A. J. McKnight 1971 16p 4refs

In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.2.A

Driver education, Driving task analysis, Driver behavior, Driver performance, Driver skills, Performance tests, Driver tests

Those behaviors considered sufficiently critical to be required of beginning drivers were selected from over 1,700 behaviors determined from an analysis of the highway transportation system to become driver education performance objectives. The objectives were grouped into five levels of criticality, and performance standards specifying the minimum percent of objectives that must be correctly performed at each level were developed. A set of enabling knowledge and skill objectives were prepared in support of performance objectives. Knowledges included procedures, facts, and concepts that enable performance to occur by explaining either 'how' or 'why' the performance was to take place. Skill objectives were descriptions of perceptions or coordinations that required not only knowledge but repeated practice for their mastery. To assist driver educators in assessing the degree to which instruc-

Group 3E—Driver Education

tional objectives have been attained, a knowledge and performance test was developed.
HS-013 506

DEVELOPMENT OF AN 'ADVANCED' DRIVER EDUCATION PROGRAM

General Motors Proving Ground, Milford, Mich.

F. D. Smithson 1971 20p

Presented by L. F. Ardouillie, General Motors Continental S. A.
In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.2.A

Behind the wheel instruction, Classroom driver instruction, Driver education evaluation, Driver performance, Accident avoidance, Skid control, Braking, Tire failures, Steering, Police training

An Advanced Driver Education Program has been developed based on the concept of training drivers to handle specific driving emergencies that accident causation data indicate are driver problems. Training exercises in off road recovery, skid control, controlled braking, evasive maneuvering, steering on a serpentine course, and handling tire failures have been designed to be used in connection with classroom instruction. This course was used as a training program for 30 police officers in Oakland County, Michigan, in October, 1969. Subsequent accident records of the trained group were compared with those of an untrained control group. As of March, 1971, the trained group showed a 50% reduction in accidents as compared to the untrained group.
HS-013 507

THE UTILITY OF RELEVANT DRIVER SIMULATION FOR TRAINING

Cornell Aeronautical Lab., Inc., Buffalo, N.Y.

A. Zavala 1971 12p 29refs

In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.2.B

Driving simulation, Driver education simulation, Accident avoidance, Driver performance under stress, Emergency training, Driver skills, Driving tasks, Driver emergency responses

Most people, even as they are learning to drive, already know how to operate the controls, switches, and pedals found in a car. However, the sequence in which these should be operated, and the conditions under which they are operated, must be learned and overlearned. The psychomotor skills of most drivers are adequate under routine conditions but deteriorate under the stresses of speed, accuracy, task load, and information load. Such stresses can occur simultaneously under emergency conditions. Therefore, the overlearning of emergency driving skills is an important potential use for driver simulators. Driving simulation must be aimed at training specific population groups in specific control tasks under emergency and routine driving conditions. High-accident-rate driving populations who receive such simulation training would be more adequately prepared to handle routine and emergency driving situations, and would thereby reduce the likelihood of being involved in a collision.
HS-013 508

AN EXPERIMENTAL EVALUATION OF A SHADOWGRAPH SIMULATOR FOR DRIVER TRAINING

Road Res. Lab., Crowthorne, Berks. (England)

J. P. Henry 1971 16p

In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.2.B

Driving simulators, Driver education simulation, Behind the wheel instruction, Driver license examination, Driver age, Driver sex, Age factor in driving, Student drivers, Driver education evaluation, Driver performance, Great Britain

Two groups of pupils without driving experience were matched for age and sex and taught to drive up to the standard of the British driving test. One group received its first three instruction hours on a shadowgraph simulator. The average number of instruction hours required by men who started on the simulator (including time spent on the simulator) was 23 hours; for men who had all their lessons in a car, 25 hours. Women who started on the simulator required, on average, 36 hours, and women who had all their lessons in a car, 32 hours. This does not indicate a sex difference in the amount of instruction required to learn to drive, as there is a positive correlation between age and the number of instruction hours, and the age distributions for the men and women differed. Pupils who used the simulator thought it was helpful to them.
HS-013 509

EXPRESSIVE CONSTRAINTS ON DRIVER RE-EDUCATION

Kentucky Univ., Lexington; Pittsburgh Univ., Pa.

J. W. Hutchinson, J. M. Roberts 1971 12p 5refs

In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.2.C

Driver improvement, Driver errors, Female drivers, Male drivers, Driver performance, Driver behavior, Risk taking, Motion pictures, Judgment

If drivers voluntarily test their competences by, for example, using their skills to pass other cars at high speed in situations where there is no requirement forcing them to travel at that speed, they are engaging in self-testing. Films of driving errors from a recently completed study of the effectiveness of televised, locally oriented driver reeducation were shown to groups of test subjects who were asked to answer a series of questions designed to distinguish between high and low expressive self-testers and provide a measure of each test subject's motivation profile with respect to each of the types of driving errors shown in the films. As expected, low self-testers generally perceived more threat in the filmed driver errors and exhibited more judgmental accentuation than did the high self-testers. This strongly suggests the need to account for such perceptual, motivational, and attitudinal differences in driver improvement programs.
HS-013 510

PSYCHOLOGICAL AND EDUCATIONAL METHODS OF INFLUENCING DRIVER BEHAVIOR

California Univ., Irvine

For primary bibliographic entry see Fld. 3D.

HS-013 511

AN OPTIMUM SYSTEM FOR TRAFFIC ENFORCEMENT/DRIVER CONTROL. VOL. 2 APPENDICES

111971 12595P REFS Rept. No. CAL-DMV-RSS-72-160-2; PB-217 953

Contract DL-69-001(002)

Prepared for National Hwy. Traf. Safety Administration and California State Dept. OF Motor Vehicles.
NTIS

Traffic law enforcement, State planning, State motor vehicle departments, California, Accident prevention, Computerized driver records, Regression analysis, Benefit cost analysis, Problem drivers, Traffic courts, Driver licensing, Driver improvement, Flow charts, Penalties, Police, Local government, Traffic law violations, Driver improvement schools, Driver education, Time factors, Point systems, Convictions, Driver intoxication, Accident risk forecasting, New York (State), Traffic ticket systems, State laws, Questionnaires, Surveys

The study approach, driver record analysis, citation survey, Traffic Enforcement/Driver Control System cost analysis, regression modeling and results, questionnaire responses, and cluster analysis experiment used in the development of an improved system of traffic law enforcement and driver control are presented. California's present Traffic Enforcement/Driver Control System is described, and an example of the administrative adjudication of traffic law violations in New York is included.

HS-013 513

AN OPTIMUM SYSTEM FOR TRAFFIC ENFORCEMENT/DRIVER CONTROL. FINAL REPORT, VOL. 1

**111971 12150P REFS Rept. No. CAL-DMV-RSS-72-160-1;
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Traffic law enforcement, Accident prevention, State planning, State motor vehicle departments, California, Police, Trials, Penalties, Driver records, Driver performance, Driver licensing, Accident statistics, Driver education, Problem drivers, Driver intoxication, Highway safety programs, Driver license examination, Driver attitudes, Vehicle inspection, Traffic courts, Accident investigation, Accident reporting laws, Traffic law violations, Driver improvement schools, Point systems, Warning letters, Time factors, Negligence, Driver behavior, Driver license revocation, Driver license renewal, Convictions, Driver license suspension

In response to a 1968 legislative resolution, improved driver licensing procedures: post-licensing control activities; use of driver records; allocation of traffic officers; and a unified approach to penalizing and treating negligent, intoxicated, and other problem drivers, are recommended for improved traffic law enforcement and driver control. It was found that most suspended/revoked drivers continue to drive and are usually not prosecuted for driving while suspended even when cited for moving violations due to failure or inability of courts to verify the subjects' driving status and driving record prior to adjudication. Another problem was court dismissal of prior drunk driving charges and other practices which prevented the DMV from exercising its revocation authority. An agency should be designated to centralize planning and coordination of traffic safety programs and develop and evaluate more effective accident countermeasures.

HS-013 514

OPTIMUM SYSTEM FOR TRAFFIC ENFORCEMENT/DRIVER CONTROL--THE EVALUATION OF THE RECOMMENDATIONS MADE BY THE CONSULTING FIRM

California Dept. of Motor Vehicles, Sacramento
For primary bibliographic entry see Fld. 2J.
HS-013 515

3F. Driver Licensing

DRIVER EDUCATION, A REVIEW AND SUGGESTED INNOVATIONS

For primary bibliographic entry see Fld. 3E.
HS-013 501

AN OPTIMUM SYSTEM FOR TRAFFIC ENFORCEMENT/DRIVER CONTROL. VOL. 2 APPENDICES

**111971 12595P REFS Rept. No. CAL-DMV-RSS-72-160-2;
PB-217 953**

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Traffic law enforcement, State planning, State motor vehicle departments, California, Accident prevention, Computerized driver records, Regression analysis, Benefit cost analysis, Problem drivers, Traffic courts, Driver licensing, Driver improvement, Flow charts, Penalties, Police, Local government, Traffic law violations, Driver improvement schools, Driver education, Time factors, Point systems, Convictions, Driver intoxication, Accident risk forecasting, New York (State), Traffic ticket systems, State laws, Questionnaires, Surveys

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HS-013 513

AN OPTIMUM SYSTEM FOR TRAFFIC ENFORCEMENT/DRIVER CONTROL. FINAL REPORT, VOL. 1

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Contract DL-69-001(002)

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NTIS

Traffic law enforcement, Accident prevention, State planning, State motor vehicle departments, California, Police, Trials, Penalties, Driver records, Driver performance, Driver licensing, Accident statistics, Driver education, Problem drivers, Driver intoxication, Highway safety programs, Driver license examination, Driver attitudes, Vehicle inspection, Traffic courts, Accident investigation, Accident reporting laws,

Group 3F—Driver Licensing

Traffic law violations, Driver improvement schools, Point systems, Warning letters, Time factors, Negligence, Driver behavior, Driver license revocation, Driver license renewal, Convictions, Driver license suspension

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HS-013 514

3H. Environmental Effects**NIGHT DRIVING VISIBILITY WITH PRESENT EUROPEAN HEADLIGHTS**

Uppsala Univ. (Sweden)

For primary bibliographic entry see Fld. 5J.

HS-013 495

3K. Pedestrians**PEDESTRIAN SAFETY FOR URBAN STREETS, VOL. 2. FINAL REPORT**

111972 12107P

Sponsored by California Office of Traf. Safety and National Hwy. Traf. Safety Administration.
NTIS

Pedestrian safety, Pedestrian education, Public information programs, Safety programs, Child safety education, San Jose (Calif.), Safety propaganda, Safety campaigns, School safety patrols, Pedestrian regulations, Bicycle safety, Mass media

A summary of the educational activities and resource materials that were developed or used by the City of San Jose's Pedestrian Safety Project are presented. This volume was designed to aid other cities and agencies in the development of safety programs to solve their pedestrian accident problem.

HS-845 010

PEDESTRIAN SAFETY FOR URBAN STREETS, VOL. 3. FINAL REPORT

111972 1269P 23REFS

Sponsored by California Office of Traf. Safety and National Hwy. Traf. Safety Administration.
NTIS

Pedestrian safety, Bicycle safety, Curricula, Instruction materials, Pedestrian education, Child safety education, San Jose (Calif.)

A preliminary pedestrian and bicycle safety curriculum and resource guide, designed to help the elementary school teacher teach pedestrian and bicycle safety, is presented.

HS-845 011

3L. Vision**VISUAL SCAN PATTERNS OF NOVICE AND EXPERIENCED DRIVERS**

Ohio State Univ., Columbus

R. R. Maurant, T. H. Rockwell 1971 20p 7refs

In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.2.A

Eye movements, Driver experience, Visual perception, Driving task analysis, Mirror usage, Driver monitoring, Design of experiments, Test volunteers, Data reduction

Using a newly developed television system for recording automobile drivers' eye movements, six novice drivers were tested at three training levels: when they had zero experience, four hours experience, and eight hours experience. A control group, consisting of four experienced drivers, was tested at two time periods which were one week apart. All subjects drove a 1970 Chrysler on a neighborhood route where the speed limit was 25 mph. Results showed that the visual search activity of the novice drivers decreased as they gained driving experience. In addition, the novice drivers' mean horizontal looking location was further to the right than the experienced drivers, and they sampled their mirror quite infrequently. It was hypothesized that the visual scan patterns of the novice drivers might be due to their high degree of concentration on controlling the automobile in the lateral and longitudinal modes.

HC-013 505

VISUAL SEARCH BY AUTOMOBILE DRIVERS

Wisconsin Univ., Madison

G. H. Robinson, R. L. Clark, D. J. Erickson, G. L. Thurston
1971 20p 14refs

Grant PHS-U100066

In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.2

Eye movements, Head movement, Lane changing, Merging, Visual behavior, Search performance, Mirror usage, Driving task analysis

Unsuspecting drivers were observed at an intersection which required a stop before entering a through highway. Head movements to the right, center, and left were recorded. A second experiment used test subjects in a lane changing situation. Head movement measurements were used to infer patterns and timing of search. The relationship between eye and head movements and some implications of the data are discussed.

HS-013 476

TRANSLATION OF DRIVER INFORMATION REQUIREMENTS TO ROADWAY DELINEATION SYSTEMS

Pennsylvania State Univ., University Park; Institute for Res., State Coll., Pa.

For primary bibliographic entry see Fld. 2I.

HS-013 491

PERCEPTION OF HIGHWAY TRAFFIC SIGNS

Institutet for Arbetshygien, Helsinki (Finland)

For primary bibliographic entry see Fld. 2I.

HS-013 492

December 12, 1973

OTHER SAFETY-RELATED AREAS—Field 4

Information Technology—Group 4E

ENGINEERING OF TRAFFIC MARKERS TO SATISFY REQUIREMENTS OF PERCEPTUAL SPACE

Alberta Univ., Edmonton (Canada)
For primary bibliographic entry see Fld. 2I.
HS-013 493

4. OTHER SAFETY-RELATED AREAS

4B. Community Support

MASS MEDIA COMMUNICATIONS AND DRIVER BEHAVIOR

University of Southern California, Los Angeles
For primary bibliographic entry see Fld. 3D.
HS-013 512

PEDESTRIAN SAFETY FOR URBAN STREETS, VOL. 2. FINAL REPORT

111972 12107P

Sponsored by California Office of Traf. Safety and National Hwy. Traf. Safety Administration.
NTIS

Pedestrian safety, Pedestrian education, Public information programs, Safety programs, Child safety education, San Jose (Calif.), Safety propaganda, Safety campaigns, School safety patrols, Pedestrian regulations, Bicycle safety, Mass media

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HS-845 010

PEDESTRIAN SAFETY FOR URBAN STREETS, VOL. 3. FINAL REPORT

111972 1269P 23REFS

Sponsored by California Office of Traf. Safety and National Hwy. Traf. Safety Administration.
NTIS

Pedestrian safety, Bicycle safety, Curricula, Instruction materials, Pedestrian education, Child safety education, San Jose (Calif.)

A preliminary pedestrian and bicycle safety curriculum and resource guide, designed to help the elementary school teacher teach pedestrian and bicycle safety, is presented.
HS-845 011

TRAFFIC SAFETY PLANNING AND ADMINISTRATIVE STUDY FOR THE CITY OF SEAL BEACH

Lampman and Associates, Santa Ana, Calif.
For primary bibliographic entry see Fld. 2.
HS-845 014

A RESOURCE ALLOCATION STUDY FOR TRAFFIC SAFETY IN THE CITY OF SAN JOSE. FINAL REPORT

111973 1238P

Sponsored by California Office of Traf. Safety and National Hwy. Safety Bureau.
NTIS

Highway safety programs, San Jose (Calif.), Highway safety standards, Safety standards compliance, Local government, Police traffic services, Planning, Data banks, Public works, Automated accident records, Traffic law enforcement, Computerized records management

Stanford Research Institute (SRI) reviewed all departments within the City of San Jose which were concerned in any way with traffic safety. This review indicated that only the Police and Public Works Departments are involved directly in the field of traffic safety. A description of work flow related to traffic safety was made in these departments by analyzing the duties of individuals and the chain of events used to accomplish their tasks. Some recommendations for traffic safety resource allocations made by SRI are summarized and progress and difficulties encountered by the City in implementing SRI's recommendations are discussed. The present status of San Jose's traffic safety program with regard to the national highway safety standards is outlined.

HS-845 015

4C. Cost Effectiveness

MASS MEDIA COMMUNICATIONS AND DRIVER BEHAVIOR

University of Southern California, Los Angeles
For primary bibliographic entry see Fld. 3D.
HS-013 512

RESOURCE ALLOCATION STUDY FOR TRAFFIC SAFETY [IN THE CITY OF SAN JOSE]. IMPLEMENTATION PLAN AND PROCEDURES. TECHNICAL NOTE

Stanford Res. Inst., Menlo Park, Calif.
For primary bibliographic entry see Fld. 2I.
HS-845 013

4E. Information Technology

EXPERIMENTAL SYSTEMS ANALYSIS OF DELAYED STEERING FEEDBACK

Wisconsin Univ., Madison
For primary bibliographic entry see Fld. 5R.
HS-013 479

SAFETY STATUS OF VEHICLES-IN-USE STUDY. SUMMARY FINAL REPORT

Ultrasystems, Inc., Newport Beach, Calif.
For primary bibliographic entry see Fld. 5I.
HS-800 894

SAFETY STATUS OF VEHICLES-IN-USE STUDY. FINAL CONTRACT REPORT

Ultrasystems, Inc., Newport Beach, Calif.
For primary bibliographic entry see Fld. 5I.
HS-800 898

A RESOURCE ALLOCATION STUDY FOR TRAFFIC SAFETY IN THE CITY OF SAN JOSE. FINAL REPORT

Stanford Res. Inst., Menlo Park, Calif.
For primary bibliographic entry see Fld. 2K.
HS-845 012

Group 4E—Information Technology**RESOURCE ALLOCATION STUDY FOR TRAFFIC SAFETY [IN THE CITY OF SAN JOSE]. IMPLEMENTATION PLAN AND PROCEDURES. TECHNICAL NOTE**

Stanford Res. Inst., Menlo Park, Calif.
For primary bibliographic entry see Fld. 2I.
HS-845 013

4G. Mathematical Sciences**THE USE OF MOVIE FILM AND LABORATORY METHODS FOR ASSESSING DRIVING SKILL**

American Institutes for Res., Silver Spring, Md.
For primary bibliographic entry see Fld. 3D.
HS-013 468

MEASUREMENT AND INTERPRETATION OF DRIVER-VEHICLE SYSTEM DYNAMIC RESPONSE

Systems Technology, Inc., Hawthorne, Calif.
For primary bibliographic entry see Fld. 3D.
HS-013 472

ON THE EFFECTS OF STATE-VARIABLE FEEDBACK ON DRIVER-VEHICLE BEHAVIOR IN CAR FOLLOWING

Ohio State Univ., Columbus
For primary bibliographic entry see Fld. 3D.
HS-013 500

HOMOGENEOUS SAFETY AMID HETEROGENEOUS CAR POPULATION?

Renault State-Owned Works (France)
For primary bibliographic entry see Fld. 5D.
HS-013 533

FRONTAL CRASH--INFLUENCE OF THE DECELERATION MODE (AT THE SEAT BELTS ANCHORAGE POINTS) ON SEVERITY INDICES

Motor Vehicles Safety Design Office
For primary bibliographic entry see Fld. 5N.
HS-013 535

ACTIVE SAFETY. A CONTRIBUTION TO THE STUDY OF THE VEHICLE-DRIVER SYSTEM. A FIRST APPROACH TO THE DEFINITION OF AN UNDULATION SURFACE FOR ROAD-HOLDING TESTS

Alfa Romeo S.P.A., Milan (Italy)
For primary bibliographic entry see Fld. 5R.
HS-013 536

SAFETY STATUS OF VEHICLES-IN-USE STUDY. FINAL CONTRACT REPORT

Ultrasystems, Inc., Newport Beach, Calif.
For primary bibliographic entry see Fld. 5I.
HS-800 898

RESOURCE ALLOCATION STUDY FOR TRAFFIC SAFETY [IN THE CITY OF SAN JOSE]. IMPLEMENTATION PLAN AND PROCEDURES. TECHNICAL NOTE

Stanford Res. Inst., Menlo Park, Calif.

For primary bibliographic entry see Fld. 2I.
HS-845 013

4H. Transportation Systems**DRIVING AIDS**

Transport and Road Res. Lab., Crowthorne, Berks. (England)
For primary bibliographic entry see Fld. 5D.
HS-013 520

5. VEHICLE SAFETY**5A. Brake Systems****INTERNATIONAL TECHNICAL CONFERENCE ON EXPERIMENTAL SAFETY VEHICLES (3RD), UNITED KINGDOM PRESENTATION. CONFERENCE PAPERS, WASHINGTON, D. C., MAY 30-JUNE 2, 1972**

111972 12161P REFS

Includes HS-013 519–HS-013 529.
Corporate author

Accident prevention, Vehicle design, Vehicle handling, Antilocking devices, Instrumentation, Electric systems, Vehicle lighting, Suspension systems, Impact tests, Occupant protection, Seat belt design, Automatic seat belts, Side impact collisions, Lateral intrusion, Experimental automobiles, Safety cars, Driver vehicle interface, Driver aid systems, Display systems, Pedestrian safety, Great Britain

In the United Kingdom it is felt that accidents can be avoided if cars have better handling qualities and equipment which gives drivers more information about their surroundings and what they and others are doing; occupants should be protected against accidents as far as possible; and vehicles should be designed to minimize injuries inflicted on those whom they strike. The British Car Safety Program emphasizes the development of practical engineering safety systems capable of being incorporated into a wide variety of cars. Papers dealing with driver aid and information systems, vehicle handling, occupant protection, impact testing, and improved body design are presented.

HS-013 518

ANTI-LOCKING BRAKE DEVELOPMENT IN THE UNITED KINGDOM

Girling Ltd., Birmingham (England)
P. Oppenheimer 1972 3refs

In HS-013 518, International Technical Conference on Experimental Safety Vehicles (3rd), United Kingdom Presentation. Conference Papers, London, 1972 p38-46

Antilocking devices, Antiskid brakes, Brake system design, Braking optimization, Brake performance, Wheel locking, Great Britain, Vehicle stability, Stopping distance, Road conditions, Pavement friction

The history and the current status of antilocking brake system development and testing in the United Kingdom are outlined. Rear wheel antilocking systems are presently available which meet the experimental safety vehicle braking specification. It is felt that the immediate introduction of such systems would make a significant contribution to road safety by eliminating accidents due to rearwheel lockup and the resultant service experience in terms of reliability and maintenance requirements

would be valuable towards the eventual introduction of four wheel antilocking systems. Four wheel antilocking systems can provide controllability, as well as lateral stability, enabling the driver to brake and steer in an emergency. However, there are some fundamental problems and technical difficulties regarding four wheel systems which still need to be solved.

HS-013 522

5D. Design

COLLISION PROTECTION FOR THE ARCTIC SURFACE EFFECT VEHICLE

Naval Ship Res. and Devel. Center, Carderock, Md.
W. E. Gilbert 1973 78p 17refs Rept. No. NSRDC-3885; AD-758 359

Sponsored by Advanced Res. Projects Agency.
NTIS

Vehicle design, Safety design, Crashworthiness, Impact protection, Energy absorption, Air cushion vehicles, Impact attenuators, Shock absorbers, Kinetic energy, Ice, Underbodies, Energy absorbing materials, Crash cushions, Plastic hinges, Deformation, Energy absorbing bumpers, Tubes, Loads (forces), Buckling, Energy absorbing steering columns, Deflection, Load transfer, Acceleration response, Collapse

The approach to collision protection for the Arctic surface-effect vehicle (ASEV) is presented, and various energy absorbing concepts are investigated and evaluated for their possible use in protecting the ASEV in ice obstacle impacts. Schemes being investigated are the air bag, foam-core sandwich panels, energy absorbing steering columns, inverting and torsional tubes, fluid dispersal shock absorbers, and tubes which buckle inextensionally in axial compression. The air bag concept and tubes in axial inextensional buckling seem the most promising. A load distribution system is proposed which will offer protection against obstacle impact between two discrete major components. In addition, a bumper system is briefly studied which will absorb minor collision impact. Several problems involved in designing underbody structure and criteria for this design are also presented.

HS-013 516

INTERNATIONAL TECHNICAL CONFERENCE ON EXPERIMENTAL SAFETY VEHICLES (3RD), UNITED KINGDOM PRESENTATION. CONFERENCE PAPERS, WASHINGTON, D. C., MAY 30-JUNE 2, 1972

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Includes HS-013 519--HS-013 529.

Corporate author

Accident prevention, Vehicle design, Vehicle handling, Antilocking devices, Instrumentation, Electric systems, Vehicle lighting, Suspension systems, Impact tests, Occupant protection, Seat belt design, Automatic seat belts, Side impact collisions, Lateral intrusion, Experimental automobiles, Safety cars, Driver vehicle interface, Driver aid systems, Display systems, Pedestrian safety, Great Britain

In the United Kingdom it is felt that accidents can be avoided if cars have better handling qualities and equipment which gives drivers more information about their surroundings and what they and others are doing; occupants should be protected against accidents as far as possible; and vehicles should be designed to minimize injuries inflicted on those whom they

strike. The British Car Safety Program emphasizes the development of practical engineering safety systems capable of being incorporated into a wide variety of cars. Papers dealing with driver aid and information systems, vehicle handling, occupant protection, impact testing, and improved body design are presented.

HS-013 518

TOWARDS SAFER ROAD VEHICLES. A STATEMENT OF BRITISH ACTIVITIES

Anonymous 1972

In HS-013 518, International Technical Conference on Experimental Safety Vehicles (3rd), United Kingdom Presentation. Conference Papers, London, 1972 p3-9

Vehicle safety, Great Britain, Vehicle handling, Occupant protection, Antilocking devices, Vehicle safety standards, Human body impact tolerances, Regulations

The British approach to vehicle safety is discussed. Research is directed towards designing vehicle features which might reduce the likelihood of accidents including antilocking brakes and better vehicle handling and towards improving occupant and pedestrian protection against injury. Great Britain's approach to vehicle safety standards and regulations is also briefly discussed.

HS-013 519

DRIVING AIDS

Transport and Road Res. Lab., Crowthorne, Berks. (England)

H. A. J. Prentice 1972

Presented by H. Taylor.

In HS-013 518, International Technical Conference on Experimental Vehicles (3rd), United Kingdom Presentation. Conference Papers, London, 1972 p10-23

Driver aid systems, Headup displays, Vehicle spacing display devices, Car following, Following distance, Brake lamps, Headlamp design, Headlamp aiming, Automatic headlamp dimmers, Audio devices, Radio communication, Dual mode vehicles, Automatic highways, Vehicle guidance, Automatic headway control, England

Research conducted by the Transport and Road Research Laboratory in the area of electro-mechanical driving aids is discussed. A vehicle spacing display device, multi-level brake lights, and improved headlamp systems are described. Development of an aural communication system RITA (Road Information Transmitted Aurally) which provides immediate traffic condition information to drivers, is also described. Although these devices can assist in aiding the driver it is felt that there are distinct limitations to a human being's performance as a controller, particularly with the regular increases in traffic speeds and densities. A more radical solution is now being worked on which replaces rather than merely aids the human driver. This will be achieved by converting normal road vehicles to dual mode operation. As part of this project an automatic following system giving close, high speed following is being developed. A broad outline of this work together with proposed ways in which the various steps in reaching full automation might be implemented are presented.

HS-013 520

VEHICLE INSTRUMENTATION AND ROAD SAFETY

Smiths Industries Ltd., Greenford, Mddx. (England)

W. W. Bischoff 1972

Group 5D—Design

In HS-013 518, International Technical Conference on Experimental Safety Vehicles (3rd), United Kingdom Presentation. Conference Papers, London, 1972 p47-72

Instrumentation, Instrument panels, Human factors engineering, Instrument panel visibility, Gauges, Speedometers, Headup displays, Vehicle spacing display devices, Control location, Warning systems, Commercial vehicles, Diagnostic equipment, Single wire electric systems, Electronic monitoring systems, Integrated circuits, Driver vehicle interface, Recorders, Color coding, Peripheral vision

The design and location of essential and secondary driving instruments for commercial vehicles are discussed from an ergonomic point of view. The development of a headup speed display system and a safe following distance indicator is described and schematics for on-board in service vehicle diagnostic equipment and a static plug-in system are presented. Future vehicle instrumentation concepts, including a single wire control system and an information display screen, are also discussed.
HS-013 523

SSV2 ELECTRICAL EQUIPMENT

Lucas (Joseph), (Electrical) Co. Ltd., Birmingham (England)
For primary bibliographic entry see Fld. 5J.
HS-013 524

DEVELOPMENT AND IMPROVEMENT OF IMPACT TEST METHODS

Safety and Ergonomics Motor Industry Res. Assoc. (England)
M. A. Macaulay 1972
In HS-013 518, International Technical Conference on Experimental Safety Vehicles (3rd), United Kingdom Presentation. Conference Papers, London, 1972 p91-5

Impact tests, Simulation, Dummies, Test reproducibility, Design of experiments

The main drawback to vehicle impact tests is that they are so unrepeatable that they are extremely difficult to interpret. This is due, partly, to poor definition of the test requirements. A further reason for lack of repeatability is the large number of variables which are left to the tester's discretion. Examples are presented which illustrate the problems hindering the development of good test procedures. The value of impact testing is also briefly discussed.
HS-013 526

TRRL/BRITISH LEYLAND EXPERIMENTAL SAFETY SUB-SYSTEM CONTRACTS

British Leyland Motor Corp. Ltd., London
P. M. Finch 1972
In HS-013 518, International Technical Conference on Experimental Safety Vehicles (3rd), United Kingdom Presentation. Conference Papers, London, 1972 p122-39

Experimental automobiles, Safety cars, Vehicle design, Design of experiments, Research methods, Pedestrian vehicle interface, Occupant protection, Vehicle vehicle interface, Front end collisions, Side impact collisions, Injury prevention, Prototypes, Head protection, Leg injuries, Impact protection, Steering columns, Fixed seats, Simulation models

British Leyland Motor Corporation has undertaken a number of safety projects based on a subsystem approach to the experimental safety vehicle concept. For each project, one or more

fully tested prototypes suitable for quantity production will be developed indicating the benefits likely to be derived from their partial or complete adoption, together with a consideration of their cost effectiveness. The project proposals are briefly described. Areas covered by the proposals include frontal impact protection, side intrusion protection, head protection, leg protection, steering column protection, and fixed seat design. Each project will begin with an evaluation of the performance of current designs in the required impact situation. At the same time computer simulation techniques will be utilized to help determine the first phase prototypes. The performance of the various items and assemblies will then be evaluated and the whole procedure recycled to the degree necessary to establish the final prototype designs.
HS-013 528

CITROEN PROGRAMS AND PROGRESS REPORT

Citroen S.A. (France)
S. Bohers 1972
In HS-820 217, International Conference on Experimental Safety Vehicles (3rd) Report, Washington, D. C., 1972 p2-16--2-38

Vehicle design, Crashworthy bodies, Passenger compartments, Impact protection, Occupant protection, Drop tests, Head on impact tests, Energy absorption, Polyurethane foams, Impact velocity, Pendulum tests, Energy absorbing bumpers, Experimental automobiles, Safety cars, Impact angle, Anthropomorphic dummies, Acceleration response, Severity indexes, Vehicle vehicle impact tests, Deceleration, Air bag restraint systems, Restraint system tests, Side impact tests, Bumper tests, Crush distance, Three point restraint systems, Motion pictures, Catapults, Barrier collision tests, Citroens

Citroen designed an experimental safety vehicle with emphasis on the improvement of survival space in the case of a frontal or side impact collision. The crashworthiness of the vehicle was tested by means of drop, pendulum, barrier collision, and vehicle vehicle impact tests. The vehicle was protected by energy absorbing bumpers containing polyurethane foam, and bumper test results are included. Impact tests using anthropomorphic dummies showed that an impact speed during perpendicular collision against a fixed barrier could hardly be greater than 55 kmh for the category of vehicle under consideration. The test during an oblique collision of 30 at a similar impact speed would only make it harder to meet the requirements. Three point restraint systems effectively restrained the dummies in the tests performed. Air bag restraint system tests were conducted to calculate severity indexes.
HS-013 532

HOMOGENEOUS SAFETY AMID HETEROGENEOUS CAR POPULATION?

Renault State-Owned Works (France)
P. Ventre 1972 5refs
In HS-820 217, International Conference on Experimental Safety Vehicles (3rd) Report, Washington, D. C., 1972 p2-39--2-57

Crashworthy bodies, Passenger compartments, Deformation analysis, Crush distance, Stiffness, Vehicle vehicle impact tests, Barrier collision tests, Vehicle mass, Deceleration, Vehicle center of gravity, Engine location, Body design, Impact velocity, Mathematical models, Dummies, Renaults

The stiffness aggressiveness of Renaults involved in collisions was calculated by means of barrier collision and vehicle vehicle

impact tests and mathematical models. Big vehicles have a longer crushing distance than small ones. Consequently, they should have an energy absorbing front structure and the engine should be located as far backwards as possible in the front part of the vehicle. Small vehicles should present a high crushing effort, the peak of which should be as forward as possible, the lighter the vehicle. Dummies used in the impact tests were satisfactorily restrained by a three point restraint system.
HS-013 533

SIDE INTRUSIONS

Ford Motor Co. Ltd., Brentwood, Essex (England)
M. Rodger 1972 3refs
Presented by K. Barnes
In HS-013 518, International Technical Conference on Experimental Safety Vehicles (3rd), United Kingdom Presentation. Conference Papers, London, 1972 p140-56

Side impact collisions, Lateral intrusion, Occupant protection, Vehicle vehicle interface, Vehicle vehicle impact tests, Side impact tests, Padding, Structural design, Vehicle mass, Impact angle, Crush tests, Barrier collision tests, Pole impact tests, Crashworthy bodies, Vehicle size

Problems associated with occupant protection in side impact collisions are discussed. The advantages and disadvantages of using contoured mobile barrier, flat faced barrier, vehicle vehicle, static crush, and pole impact tests to evaluate side impact performance are also discussed.
HS-13 529

5I. Inspections

SAFETY STATUS OF VEHICLES-IN-USE STUDY. SUMMARY FINAL REPORT

Ultrasystems, Inc., Newport Beach, Calif.
F. G. Fisher, Jr., P. Biche, R. Eidemiller 1973 31p Rept. No. US-8209-2-Summ
Contract DOT-HS-094-2-253
Report for Jan 1972-Mar 1973.
NTIS

For abstract and search terms see HS-800 898.
HS-800 894

SAFETY STATUS OF VEHICLES-IN-USE STUDY. FINAL CONTRACT REPORT

Ultrasystems, Inc., Newport Beach, Calif.
F. G. Fisher, Jr., P. Biche, R. Eidemiller 1973 234p Rept. No. US-8209-2
Contract DOT-HS-094-2-253
Report for Jan 1972-Mar 1973. Summary rept. is HS-800 894.
NTIS

Vehicle inspection, Defects, Diagnostic centers, Computerized diagnostic equipment, Vehicle usage, Vehicle center of gravity, Data acquisition, Automated inspection equipment, Chi square test, Brake tests, Personnel, Illinois, Jefferson City, Birmingham (Ala.), Phoenix, Montana, Hartford, Spokane, Vehicle age, Community support, Data processing, Fortran, Computer programs, Flow charts, Data analysis, Automobile models, Vehicle mileage, Weather, State action, Mathematical analysis

Vehicles-in-use were inspected in Evergreen Park, Park Ridge, Joliet, and Chicago Heights, Illinois; Spokane; Jefferson City;

Birmingham, Alabama; Phoenix; and Hartford to determine the effects of continuing usage on their safety. The data collected on this study was compared with previous study data and the results indicated that age is a critical factor affecting the number of vehicle defects. Vehicles in states with rigorous inspection systems were in better condition than vehicles in states with random or no inspection. Component test criteria was made more objective by assigning levels of defectiveness where appropriate. Existing vehicle-in-use computer software was made more general and provided with added capabilities such as the inclusion of all vehicle specifications necessary for the automobiles on United States highways. A diagnostic equipment correlation study was made on name brand braketesters and front-end geometry equipment normally found in diagnostic centers.
HS-800 898

5J. Lighting Systems

PSYCHOLOGICAL ASPECTS OF DRIVER BEHAVIOUR. VOL. 2, APPLIED RESEARCH. PAPERS PRESENTED TO THE INTERNATIONAL SYMPOSIUM HELD AT NOORDWIJKERHOUT, THE NETHERLANDS, 2-6 AUGUST 1971 111971 12362P 286REFS

Contains HS-013 491-HS-013 512.
Corporate author

Driver behavior, Vehicle lighting, Traffic signs, Driver aid systems, Driver education, Driver education evaluation, Night visibility, Rear lamps, Visual perception, Highway lighting, Headlamps, Signal lamps, Car following, Vehicle spacing display devices, Driving task analysis, Tracking, Driving simulation, Driving simulators, Driver improvement, Mass media, Delineators (traffic), Driver skills

Topics covered in the second volume of this symposium include engineering of highway delineation systems, traffic signs, and traffic markers for improved driver perception; improved highway lighting and vehicle headlamps for better night visibility; development of vehicle rear lighting and driver aid systems to aid drivers in car following; an evaluation of driver education programs and suggestions for their improvement; the usefulness of driving simulators for driver training; and methods of influencing driver behavior.
HS-013 490

THE CODING AND TRANSMISSION OF INFORMATION BY MEANS OF ROAD LIGHTING

Stichting Wetenschappelijk Onderzoek Verkeersveiligheid, Voorburg (Netherlands)
For primary bibliographic entry see Fld. 2E.
HS-013 494

NIGHT DRIVING VISIBILITY WITH PRESENT EUROPEAN HEADLIGHTS

Uppsala Univ. (Sweden)
K. Rumar 1971 12p 10refs
In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.1.B

Night visibility, Night driving, High beamed headlamps, Low beamed headlamps, Quartz halogen headlamps, Headlamp tests, Field tests, Test tracks, Wet road conditions, Reflectance, Headlamp aiming

Group 5J—Lighting Systems

Using visibility distance as a criterion, halogen and conventional continental European high and low beamed headlamps were compared in a series of field experiments. It was found that on high beams without opposing light, visibility distances are acceptable. The halogen headlights offered about 25% longer visibility distances (190 meters) than the conventional headlights (155 meters). With both opposing cars using low beams, visibility distances even under these very favorable conditions were quite insufficient (45-55 meters). There was a slight advantage (less than five meters) in favor of halogen headlamps. The optimal dimming distance was a function of the high beam system intensity. Small differences in aiming and atmosphere caused larger differences in visibility distances than did the headlamp system.

HS-013 495

CAR AND TRUCK REAR LIGHTING AND SIGNALING: THE APPLICATION OF RESEARCH FINDINGS

Michigan Univ., Ann Arbor. Hwy. Safety Res. Inst.

R. G. Mortimer 1971 16p 15refs

In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.1.B

Vehicle lighting, Signal lamps, Stop lamps, Turn signals, Color coding, Brightness, Trucks, Vehicle spacing display devices, Amber taillamps, Accident analysis, Truck accidents, Rear end collisions, Road grades, Velocity perception, Car following, Headways, Coded signals, Rear lamps, Display systems

Rear lighting and signaling systems can be improved by functional separation of lamps and color coding. These techniques will also improve system integrity when there is a malfunction, such as a bulb failure. Intensity requirements for signal lamps differing in color and area are derived by subjective tests in day and night. Brighter signal lamps are needed during the day than at night. The luminous area of the lamp area should be considered when setting intensity standards. Truck rear end collision data show the need to aid the driver in detecting changes in headway and relative speed, and development of a rear-mounted speed display is suggested. A coasting signal which would be activated five seconds after the accelerator is released could also be used to aid car followers. Characteristics of an improved rear lighting and signaling system are presented.

HS-013 496

SOME PROBLEMS IN THE DESIGN OF IMPROVED VEHICLE REARLIGHTING CONFIGURATIONS

Stichting Wetenschappelijk Onderzoek Verkeersveiligheid, Voorburg (Netherlands)

R. Roszbach 1971 8p

In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.1.B

Vehicle lighting, Rear lamps, Signal lamps, Driving task analysis, Lighting design

In view of the great uncertainty that will remain about the positive effects expected from actually introducing an improved rear lighting configuration, comparatively little benefit will be derived from experiments with complete configurations under realistic driving conditions. An approach is suggested whereby recommendations are based on an analysis of the driving task and available literature of a more general nature. The use of identical signals indicating different vehicle characteristics; use of different signals in the two configurations indicating the

same vehicle characteristics; and the introduction of new signals to indicate vehicle characteristics not indicated previously may increase accident probability. To eliminate problems in recognizing rear signal lamps, old signals could perhaps be incorporated in the new ones so that drivers can still respond to the old signals, while the discriminability of signals can be improved by introducing additional attributes to define a signal.

HS-013 497

FEEDBACK CONCEPTS IN THE DESIGN OF VEHICLE LIGHTING SYSTEM

National Chengchi Univ., Taipei (Taiwan)

H. S. R. Kao 1971 16p 9refs

Sponsored by Ministry of Education, Taiwan.

In HS-013 490, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v2, sect. 2.1.B

Vehicle lighting, Driver behavior, Tracking, Lighting design, Rear lamps, Car following, Signal lamps, Vehicle spacing display devices, Colored lamps, Headlamps, Steering, Vehicle control, Headways

A feedback-oriented framework of driver behavior is presented. It considers driving as a closed-loop vehicle-driver-road tracking system where the operator's control actions provide feedback information for his subsequent vehicle control. Lighting design under this framework links drivers with vehicles into an inter-vehicle social feedback system. Lighting will consider the driver's control activities in the rear display of the lead car. The distance between vehicles will be the basic information displayed in the lighting system with several levels of distance ranges showing the degrees of approach and warning. When driving is considered in the context of behavioral theory, headlamps should be designed to respond to steering wheel movements so that the illuminating effects of the lamps will be directly related to turning actions. This will enable the driver to see the changing visual field better, and to receive improved feedback from his control maneuvers.

HS-013 498

SOME DRIVING AIDS AND THEIR ASSESSMENTS

Road Res. Lab., Crowthorne, Berks. (England)

For primary bibliographic entry see Fld. 3D.

HS-013 499

SSV2 ELECTRICAL EQUIPMENT

Lucas (Joseph), (Electrical) Co. Ltd., Birmingham (England)

C. S. Rayner 1972

In HS-013 518, International Technical Conference on Experimental Safety Vehicles (3rd), United Kingdom Presentation. Conference Papers, London, 1972 p73-81

Vehicle lighting, Self leveling headlamps, Signal lamps, Electric systems, Headlamp design, Shutters, Glare reduction, Automatic headlamp wipers, Lamp failure detectors, Antiglare mirrors, Radar, Automatic headway control, Warning systems, British vehicles

Electrical equipment employed on the British S.S.V.2, including a self-leveling headlamp system, two-level signaling system, automatic projector lamps, automatic headlamp wipers, a lamp failure detector, an automatic anti-dazzle mirror, and a vehicle condition monitor, are described. An experimental system using radar equipment for automatic headway control is mentioned.

HS-013 524

Occupant Protection

INTERNATIONAL TECHNICAL CONFERENCE ON EXPERIMENTAL SAFETY VEHICLES (3RD), UNITED KINGDOM PRESENTATION. CONFERENCE PAPERS, LONDON, D. C., MAY 30-JUNE 2, 1972 **161P REFS**

S-013 519--HS-013 529.
author

prevention, Vehicle design, Vehicle handling, Accessories, Instrumentation, Electric systems, Vehicle suspension systems, Impact tests, Occupant protection belt design, Automatic seat belts, Side impact collision intrusion, Experimental automobiles, Safety of vehicle interface, Driver aid systems, Display pedestrian safety, Great Britain

In the United Kingdom it is felt that accidents can be avoided if better handling qualities and equipment which gives more information about their surroundings and what others are doing; occupants should be protected in accidents as far as possible; and vehicles should be designed to minimize injuries inflicted on those whom they hit. The British Car Safety Program emphasizes the development of practical engineering safety systems capable of being fitted into a wide variety of cars. Papers dealing with instrumentation and information systems, vehicle handling, occupant impact testing, and improved body design are

FOR SAFER ROAD VEHICLES. A STATEMENT OF RESEARCH ACTIVITIES

For bibliographic entry see Fld. 5D.

RESTRAINT SYSTEMS FOR THE FUTURE

United Systems Ltd. (England)
1972

518, International Technical Conference on Experimental Safety Vehicles (3rd), United Kingdom Presentation. Papers, London, 1972 p96-121

design, Automatic seat belts, Seat belt regulations, Restraint warning systems, Ignition seat belt interlock standards, Seat belt tests, Seat belt effectiveness, Energy absorbing materials, Seat belt assembly reels, Electric motors, Seat belt assembly, Injury severity index, Great Britain

Systems being developed in the United Kingdom to meet and 1975 U. S. standards are discussed. An ignition interlock system and several passive seat belt systems are described. The utilization of energy absorbing tear webbing assemblies is also discussed. The development work indicates that systems can be devised which are highly acceptable to the car driver and passengers in terms of entry and exit, method of actuation, and subcompact in use. Further refinement of such systems is needed, together with the development of energy absorbing devices to reduce maximum head deceleration and hence injury values to conform with the values required by the authorities. As an alternative to the air bag the passive belt offers certain advantages. It restrains the occu-

pants in many conditions of deceleration; its protection in conditions of rollover is possibly superior to that offered by the air bag; and in cases of secondary impact the occupant is still restrained.

HS-013 527

TRRL/BRITISH LEYLAND EXPERIMENTAL SAFETY SUB-SYSTEM CONTRACTS

British Leyland Motor Corp. Ltd., London
For primary bibliographic entry see Fld. 5D.
HS-013 528

CITROEN PROGRAMS AND PROGRESS REPORT

Citroen S.A. (France)
For primary bibliographic entry see Fld. 5D.
HS-013 532

HOMOGENEOUS SAFETY AMID HETEROGENEOUS CAR POPULATION?

Renault State-Owned Works (France)
For primary bibliographic entry see Fld. 5D.
HS-013 533

FRENCH DEVELOPMENTS OF RESTRAINT MEANS

Renault-Peugeot Assoc. (France)
H. De Lavenne 1972
In HS-820 217, International Conference on Experimental Safety Vehicles (3rd) Report, Washington, D. C., 1972 p2-58--2-62

Restraint system tests, Restraint system effectiveness, Restraint system design, Air bag restraint systems, Seat belts, Performance characteristics, European vehicles, Pyrotechnic igniters, Injury severity, Injury prevention

Results of tests conducted by the Renault-Peugeot Assoc. on U. S. and French air bag and seat belt systems are reported and a proposed outspreading cushion panel to protect occupants is briefly described. It is concluded that improved safety belts are one of the best occupant protection means provided people wear them. Air bags, either U. S. or French made, still give results that are too widespread to be acceptable for use on European vehicles. Moreover, major problems such as inefficiency with respect to different multiple impacts or reliability have not yet been solved, although some progress has been realized concerning dimensions, weight, noise, and toxicity.

HS-013 534

FRONTAL CRASH--INFLUENCE OF THE DECELERATION MODE (AT THE SEAT BELTS ANCHORAGE POINTS) ON SEVERITY INDICES

Motor Vehicles Safety Design Office
A. Cacciabue 1972
In HS-820 217, International Conference on Experimental Safety Vehicles (3rd) Report, Washington, D. C., 1972 p2-141--2-146

Seat belt design, Seat belt tests, Severity indexes, Seat belt effectiveness, Mathematical analysis, Seat belt loading, Deceleration, Seat belt assembly anchorages, Displacement, Harmonics, Occupant kinematics, Deceleration tolerances, Fourier analysis

The influences of seat belt characteristics and deceleration modes of seat belt anchorages on dummy motion were studied. A simple scheme limited to the central part of the body, which is assumed to be a concentrated mass, connected to the vehicle by means of a belt with given deformation characteristics, was

Field 5—VEHICLE SAFETY

HSL 73, No. 23

Group 5N—Occupant Protection

used. The law of motion of the belt anchorages was also assumed known. The traditional, elastic type belts examined gave similar severity indexes for the mass and for the anchorages. Some improvement could be obtained with critical damping belts. Much better results could be given by constant force belts. The filtering system, consisting of the body mass and the elastic rigidity of the belt, rendered the mass rather unsensitive to the shape of the deceleration diagram attributed to the anchorages. More particularly, only the first harmonic of the Fourier series development of the excitation diagram can make a noticeable difference to the severity index of the mass restrained by the belt.

HS-013 535

SIDE INTRUSIONS

Ford Motor Co. Ltd., Brentwood, Essex (England)
For primary bibliographic entry see Fld. 5D.

HS-13 529

5O. Propulsion Systems

ELECTROCHEMICAL POWER SOURCES FOR ELECTRIC HIGHWAY VEHICLES. FINAL REPORT

Little (Arthur D.), Inc., Cambridge, Mass.
J. H. B. George 1972 27p Rept. No. DOT-TSC-OST-73-1;
C-74692; PB-216 622
Sponsored by Department of Transp.
NTIS

Fuel cells, Lead acid batteries, Nickel iron batteries, Metal air batteries, Electric vehicles, Sodium sulfur batteries, Lithium sulfur batteries, Lithium chlorine batteries, Zinc air batteries, Performance characteristics, Battery design, Battery life, Electrochemical power, Financing, Research, Benefit cost analysis, Natural resources, Environmental factors, Economic factors

The present status of lead acid and nickel iron batteries, batteries under development, and fuel cells relevant to electric vehicle propulsion are discussed and technical problems are outlined. The impact of electrochemical power sources on natural resources and air quality is also discussed. Greater investment by the federal government in research and development relating to electrochemical power sources is recommended. Present efforts appear underfunded in relation both to the magnitude of the technical problems and to the significance of the technology to the transportation field. The high temperature alkali metal battery development programs seem most deserving of increased support, in view of their potential for achieving the high power and energy densities required by highway vehicles and the relatively unexplored state of their technology. Fuel cell development would appear to be second in order of merit because of the fuel cell's high effective energy density and its greater compatibility with existing systems of vehicle fuel distribution.

HS-013 517

5R. Steering Control Systems

ON STEERING DYNAMICS OF TRACKED VEHICLES--RESULTS OF AN ANTHROPOTECHNICAL INVESTIGATION BY USING A NOVEL DRIVING SIMULATOR

Forschungsinstitut für Anthropotechnik, Meckenheim (West Germany)
K. D. Schulz-Helbach, E. Donges 1971 18p 4refs

In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.2

Tracked vehicles, Steering, Driving simulators, Driver vehicle interface, Vehicle dynamics, Vehicle control, Steering systems, Tracking, Steering gear, Analog computers, Gear shifting, Statistical analysis, Turning radius, Vehicle handling

The handling qualities of three steering dynamics--discontinuous, constant, and speed dependent--of tracked vehicles were investigated. Eighteen subjects participated in tracking tasks carried out in a driving simulator. Besides the simulation of the various steering dynamics, the simulator included a motor noise and motion simulation. A novel vision simulator generated, by exclusive use of electronic means, a stylized image of a road in the form of a winding, circular course of about 3.2 km in length. The investigation of the immediate effects of gear changes and the analysis of root mean square values of lateral deviation indicated statistically significant differences favoring the speed dependent steering dynamics. For tracked vehicles like the test vehicle, therefore, a steering dynamic is recommended which has a continuous, rather than a discontinuous steering sensitivity inversely proportional to the velocity.

HS-013 478

EXPERIMENTAL SYSTEMS ANALYSIS OF DELAYED STEERING FEEDBACK

Wisconsin Univ., Madison
K. U. Smith 1971 20p 4refs
In HS-013 461, Psychological Aspects of Driver Behaviour, Voorburg, 1971, v1, sect. 1.2

Steering, Feedback delays, Cybernetics, Vehicle control, Driver vehicle road interfaces, Driver performance, Man machine systems, Vehicle design, Driving simulation, Computerized simulation, Real time operations, Tracking, Loss of control, Power steering systems, Visual perception, Eye movements, Motor skills, Vehicle dynamics, Accident causes, Systems analysis, Driver education, Driver behavior, Vigilance tasks

Two modes of steering operate in driving--projected feedforward guidance of the car and vigilant close-up steering under conditions of limited vision and emergency control of the vehicle. Computerized, experimental systems studies of simulated steering feedback were conducted to determine the effect of feedback delays on vehicle control. Feedback delays had their main effects on vigilant steering. Two types of feedback delay--perceptual delays and time lags between steering wheel movement and car action--had differential effects on accuracy of steering. Other findings indicated that steering feedback delays altered the pattern of eye movements in driving and destroyed the time synchronism between hand motions and eye tracking. The results of experimental systems studies support a behavioral cybernetic approach to driving and suggest ways that vehicle design and driver training can be adjusted to correspond with feedback factors.

HS-013 479

INTERNATIONAL TECHNICAL CONFERENCE ON EXPERIMENTAL SAFETY VEHICLES (3RD), UNITED KINGDOM PRESENTATION. CONFERENCE PAPERS, WASHINGTON, D. C., MAY 30-JUNE 2, 1972

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December 12, 1973

VEHICLE SAFETY—Field 5

Trucks And Trailers—Group 5T

Accident prevention, Vehicle design, Vehicle handling, Antilocking devices, Instrumentation, Electric systems, Vehicle lighting, Suspension systems, Impact tests, Occupant protection, Seat belt design, Automatic seat belts, Side impact collisions, Lateral intrusion, Experimental automobiles, Safety cars, Driver vehicle interface, Driver aid systems, Display systems, Pedestrian safety, Great Britain

In the United Kingdom it is felt that accidents can be avoided if cars have better handling qualities and equipment which gives drivers more information about their surroundings and what they and others are doing; occupants should be protected against accidents as far as possible; and vehicles should be designed to minimize injuries inflicted on those whom they strike. The British Car Safety Program emphasizes the development of practical engineering safety systems capable of being incorporated into a wide variety of cars. Papers dealing with driver aid and information systems, vehicle handling, occupant protection, impact testing, and improved body design are presented.

HS-013 518

VEHICLE HANDLING

British Leyland Motor Corp. Ltd., London

G. Jones 1972

In HS-013 518, International Technical Conference on Experimental Vehicles (3rd), United Kingdom Presentation. Conference Papers, London, 1972 p24-37

Vehicle handling, Vehicle stability, Vehicle dynamics, Oversteer, Understeer, Steady state, Unsteady state, Yaw, Tethered tests, Lateral acceleration, Resonant frequency, Vehicle design, Vehicle performance, European vehicles, Specifications, Performance characteristics

Problems involved in determining valid safety related vehicle handling specifications are discussed. The oversteer and understeer phenomena are defined and vehicle steady state response and transient response are considered. Skid pad and chicane tests used for many years to assess handling are mentioned.

HS-013 521

ACTIVE RIDE CONTROL--ITS CONTRIBUTION TO IMPROVED HANDLING

Automotive Products Group (England)

W. N. Bainbridge 1972

In HS-013 518, International Technical Conference on Experimental Safety Vehicles (3rd), United Kingdom Presentation. Conference Papers, London, 1972 p82-90

Suspension system design, Hydraulic equipment, Cornering, Vehicle handling, Performance tests, Vehicle performance, Pitch, Performance characteristics, Vehicle control, Roll, Vehicle riding qualities, British vehicles

An experimental active suspension system is described and the dynamic performance of the system is discussed. From a safety point of view the two most important gains of this active suspension system are the improved degree of control during an

avoidance maneuver and the large increase in cornering power. The absence of any feeling of delay or overreaction to steering wheel movements adds a new dimension to the concept of high speed controllability. Both of these gains are without impairment to the ride characteristics. Other benefits which should follow from this type of system are improved tire life, increased braking performance, and constant headlight attitude.

HS-013 525

ACTIVE SAFETY. A CONTRIBUTION TO THE STUDY OF THE VEHICLE-DRIVER SYSTEM. A FIRST APPROACH TO THE DEFINITION OF AN UNDULATION SURFACE FOR ROAD-HOLDING TESTS

Alfa Romeo S.P.A., Milan (Italy)

A. Schiappati 1972

In HS-820 217, International Conference on Experimental Safety Vehicles (3rd) Report, Washington, D. C., 1972 p2-146-2-156

Vehicle performance, Vehicle dynamics, Performance tests, Vehicle stability, Vehicle handling, Pavement surface texture, Yaw, Vehicle trajectories, Understeer, Oversteer, Vehicle weight, Fourier analysis, Spectral analysis, Roll, Power spectral density, Steady state, Mathematical analysis, Lateral acceleration

Entry to and exit from a circular arc bend joining two perpendicular straight lanes and change of trajectory on a straight road, simulating a lane changing maneuver to overtake or to avoid an obstacle which was noticed rather late by the driver, were tested to establish dynamic characteristics of experimental safety vehicles. A rough road surface to be used for road holding tests is defined mathematically. With respect to the type of test on the average behavior of the vehicle on rough surfaces, a transient test is not suitable to show the vehicle sensibility to surface roughnesses alone, because of weight transfer and roll and yaw oscillations. It is recommended that a steering pad be used for such tests.

HS-013 536

5T. Trucks And Trailers

CAR AND TRUCK REAR LIGHTING AND SIGNALING: THE APPLICATION OF RESEARCH FINDINGS

Michigan Univ., Ann Arbor. Hwy. Safety Res. Inst.

For primary bibliographic entry see Fld. 5J.

HS-013 496

COLLISION PROTECTION FOR THE ARCTIC SURFACE EFFECT VEHICLE

Naval Ship Res. and Devel. Center, Carderock, Md.

For primary bibliographic entry see Fld. 5D.

HS-013 516

VEHICLE INSTRUMENTATION AND ROAD SAFETY

Smiths Industries Ltd., Greenford, Mddx. (England)

For primary bibliographic entry see Fld. 5D.

HS-013 523

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CONTRACTS AWARDED

NHTSA CONTRACT AWARDS

DOT-HS-018-3-597

OSE PERIODIC REPORTS SYSTEM

Control Systems Research, Inc.
1515 Wilson Boulevard
Arlington, Virginia 22209

1 Nov 73 to 15 Mar 74

\$22,856.00

This modification provides for the operation and maintenance of the OSE Periodic Reports System for the period 1 November 1973 through 15 March 1974.

DOT-HS-020-2-290 IA

DEVELOPMENT OF STANDARDS FOR BREATH TESTING EQUIPMENT

National Bureau of Standards
Law Enforcement Standards Laboratory
Washington, D.C. 20234

1973 and 1974

\$87,500.00

This interagency agreement is extended to provide for the development of a breath test calibration unit, a remote breath collector, and a passive breath tester. Standards developed will be submitted to certain interested agencies, the replies analyzed, and appropriate corrections made. Support will be furnished to the Transportation Systems Center in the development of design qualification tests, operation of the testing laboratory, and the establishment of a standards compliance information system. Recommendations will be made, as appropriate, for modification of standards.

DOT-HS-031-3-743

ANTHROPOMORPHIC CRASH TEST DUMMIES

University of Michigan
260 Research Administration Building
Ann Arbor, Michigan 48105

25 Oct 73 to 31 Dec 73

\$15,600.00

This modification provides for the acquisition of two 50th percentile anthropomorphic crash test dummies completely assembled, adjusted, and packaged ready for crash testing.

DOT-HS-032-1-036

ROLLOVER TESTS

U.S. Department of Transportation
Federal Aviation Agency
Atlantic City, New Jersey 08405

No change

\$20,608.56

This modification provides for each of seven rollover tests to include two instrumented dummies and at least two on-board cameras.

DOT-HS-068-2-356

SEAT BELT TESTS

U.S. Testing Company, Inc.
1415 Park Avenue
Hoboken, New Jersey 07030

No change

\$14,000.00

This modification provides for revised washing technique for retractor units after salt spray exposure in accordance with Lab Procedure TP-209-01, and for two additional photographs per test group.

DOT-HS-120-2-407

HEADLIGHT TESTS

Essex Corporation
303 Cameron Street
Alexandria, Virginia 20314

4 Oct 73 to 31 Mar 74

\$8,998.00

This modification provides for the reconversion of vehicles used in lighting tests to their original headlighting system and wiring. The modification also provides for the collection of certain field data and its dissemination to specified agencies.

DOT-HS-169-3-543

SAFETY RELATED DEFECTS INVESTIGATION, SCHOOL BUS REAR BRAKE SHOE FAILURES

Value Engineering Company
2550 Huntington Avenue
Alexandria, Virginia 22303

4 Oct 73 to 4 Nov 73

\$3,335.80

Nine test runs will be made to determine the effect that a broken rear brake shoe web will have on the stopping ability, stability, and directional control of a school bus. Conditions for each run are established by NHTSA.

DOT-HS-185-3-599 IA

**IN-VEHICLE LIGHT TRANSMISSION AND HEAT
TRANSFER TESTING**

National Bureau of Standards
Washington, D.C. 20234

23 Oct 73 to 31 Dec 73

\$15,000.00

This follow-on project provides for the in-vehicle testing of two passenger cars (one with tinted, one with untinted windshields) for light transmission and heat load to determine the effects of tinting glazing surfaces.

DOT-HS-223-2-383

AUDIT OF CLUTCH CABLE FAILURES

The Automobile Club of Southern California
P.O. Box 2890 Terminal B Annex
Los Angeles, California 90051

18 Oct 73 to 15 Dec 73

\$2,898.28

An audit will be conducted of certain vehicles to determine if clutch cable failures on these vehicles have caused accidents or injuries. The audit will be conducted through questionnaires to vehicle owners.

DOT-HS-256-3-688

**BINOCULAR AND MONOCULAR FIELD OF VIEW
PERFORMANCE TEST**

Tracor/Jitco, Inc.
1300 E. Gude Drive
Rockville, Maryland 20851

4 Oct 73 to 4 Feb 74

\$6,211.00

This modification provides for increasing the test subjects from 12 to 87; for changing from one test per subject to three repeated tests per subject; and for changing from one view to rear, to one directly to the rear, one to the rear right, and one to the rear left.

DOT-HS-322-3-621

**AN EVALUATION OF THE U.S. FAMILY SEDAN ESV
PROJECT**

Battelle Memorial Institute
505 King Avenue
Columbus, Ohio 43201

31 Oct 73 to 31 July 74

\$56,200

This modification provides for a technical review and analysis of all test data on ESV's produced by four contractors. The task includes a quantitative review, analysis and evaluation of the test data, analysis of design solutions, significance of results, and conclusions and recommendations.

DOT-HS-4-00795

EVALUATE EFFECTIVENESS OF ORBIS III

Town of West Orange, New Jersey
66 Main Street
West Orange, New Jersey 07052

1 Oct 1973 to 30 June 74

\$7,898.06

The effectiveness of the Orbis III system in reducing motor vehicle accident frequency or severity will be evaluated. The evaluation will include plans; accomplishments; interim results, trends, and conclusions and actions required to alleviate problems encountered.

DOT-HS-4-00798

CONVEX MIRROR SYSTEMS FOR GSA CARS

Donnelly Mirrors, Inc.
49 West Third Street
Holland, Michigan 49423

1 Oct 1973 to 26 Nov 73

\$4,731.12

As a follow-on and expansion of an earlier program evaluating periscopic viewing devices for vehicles, 4 European-type convex mirror systems will be designed, manufactured, and installed on the left and right front fenders of certain designated vehicles. Additionally, inside plane mirrors and right outside convex mirrors will be designed, manufactured, and installed on 4 designated vehicles. Specifications for mirror design are furnished by NHTSA.

DOT-HS-4-00801

MANAGEMENT BY OBJECTIVES WORKSHOP

Organizational Development Associates, Inc.
Suite 549, 1500 Massachusetts Avenue, N.W.
Washington, D.C. 20005

10 Oct 73 to 30 Jan 74

\$4,900.00

A Management by Objectives workshop will be planned, developed, conducted, and evaluated. The plan will specify objectives, program, procedure, content of the workshop, materials, tests, questionnaires, and schedules.

DOT-HS-4-00802

SAFETY HELMET PERFORMANCE INVESTIGATION

Southwest Research Institute
500 Culebra Road
San Antonio, Texas 78284

13 Oct 73 to 17 Jan 74

\$17,840.00

An investigation will be made to ascertain the capability of available helmets to meet the head injury criterion proposed in the motorcycle helmet Notice of Proposed Rule Making for September 1974, and to correlate the performance of similar helmets when tested for impact attenuation using both a magnesium alloy headform and a similar headform constructed to simulate the human head. Based on analysis of the test data, recommended improvements for the helmet impact attenuation test procedures will be made.

DOT-HS-4-00803

MODEL 2850 DATA AMPLIFIER

Dana Laboratories, Inc.
401 Campus Drive
Irvine, California 92664

9 Oct 73 to 30 Nov 73

\$5,090.00

Provides for the acquisition of one Model 2850 Data Amplifier, Option V2, and one 2808-2 Spec. Rack Enclosure.

DOT-HS-4-00804

DEVELOPMENT OF A LABORATORY PROCEDURE FOR FMVSS NO. 218, MOTORCYCLE HELMETS

Dayton T. Brown, Inc.
Church Street
Bohemia, New York 11716

5 Oct 73 to 15 Jan 74

\$6,335.00

A detailed laboratory procedure will be developed to guide test laboratories in the performance and reporting of results obtained during Standards Enforcement Test Programs conducted for NHTSA-OSE in accordance with FMVSS No. 218.

DOT-HS-4-00806

TESTING OF TRUCK-CAMPER LOADING

Agbabian Associates
250 North Nash Street
El Segundo, California 90245

24 Oct 73 to 25 Oct 74

\$10,700.00

Twenty tests will be conducted, each test using one truck and one camper, to determine conformance with Federal Motor Vehicle Safety Standard 126 and Part 575.103, Consumer Information. The tests will be performed as outlined in NHTSA Laboratory Procedure for Truck-Camper Loading Tests, TP-126-00, May 1973.

DOT-HS-4-00809

MULTIDISCIPLINARY HIGHWAY COLLISION INVESTIGATION

University of Southern California
University Park
Los Angeles, California 90007

26 Nov 73 to 31 Jan 74

\$20,000.00

A 2-week course on Multidisciplinary Highway Collision Investigation will be conducted. All resources, including instructors, facilities, classrooms, transportation during the course, and training materials, will be furnished, as well as the salary, travel, and per diem of instructors, consultants, and technical and administrative personnel required to conduct the course.

**U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**

Office of Administration
WASHINGTON, D.C. 20590

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